IMPACT OF SOVEREIGN CREDIT RATINGS ON EMERGING BOND AND STOCK MARKET RETURNS

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ABSTRACT

The primary role of credit rating agencies is to reduce asymmetric information between the parties in a lending relationship. The three major rating agencies have received extensive criticism over the years. These rating agencies have been accused of providing inaccurate ratings which ultimately led to various financial calamities. Late rating action has also been blamed for exacerbating financial and economic cycles. Moreover, there is an argument that emerging markets are unfairly rated in comparison to developed economies. Hence, the reliability and informational value of the assessments provided by credit rating agencies is met with scepticism.

Despite these criticisms, rating agencies are characterised as gatekeepers to capital and credit ratings remain essential financial market indicators. Albeit, the literature regarding the impact of sovereign credit ratings on bond and stock markets is inconclusive.
This study aims to add to the body of literature and provide insights into the informational value of sovereign credit ratings in emerging markets. More specifically to estimate the relationship between various sovereign credit rating announcements, and bond and stock market returns. Also, to examine whether sovereign credit ratings have a differential impact between bond and stock markets. As well as address the question does it matter who provides the rating?

Using an event study, abnormal returns surrounding rating announcements from 2009 to 2019 for 24 emerging markets were analyzed. Firstly, this study concluded that sovereign credit ratings are informative. Secondly, the degree of informativeness differs between the bond and stock markets. Thirdly, an asymmetrical impact was observed between the types of rating announcements. Lastly, that it does matter which rating agency provides the rating because each agency has a unique reputation. The findings of this research have implications on how investors and portfolio managers decide on asset allocation. Furthermore, policymakers may find our investment grade analysis of value when evaluating regulatory reform. It's recommended that future research refines the event methodology and examines country specific characteristics within each of the emerging markets.

DECLARATION OF ORIGINAL WORK

This page declares that the work produced in this thesis is my own and was conducted whilst completing the degree of Master of Commerce in Financial Markets whilst at Rhodes University. Any work that is not my own has been credited accordingly. I Zoyisile Mkhonto certify that this thesis has not been submitted for a degree in any other university, technikon nor college.

December 2020 _____

Date Zoyisile Mkhonto

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PREFACE

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CHAPTER 1: INTRODUCTION

1.1. RESEARCH CONTEXT

Credit Rating Agencies (CRA) collect and monitor material information on a borrower to form an opinion about its creditworthiness (White, 2018). Credit ratings are typically assigned in the form of a grade symbolised with an alphabetical letter code for example AAA which can be interpreted as a probability of default. Through economies of scale CRA offer cost-effective services which are particularly beneficial for smaller financial institutions (Wakeman, 1981). Larger institutions such as commercial banks have internal credit expertise and utilise CRA assessments to facilitate the estimation of risk involved in a transaction. The primary role of CRAs is to reduce asymmetric information between the parties in a lending relationship (Ligeti and Szorfi, 2016). Asymmetric information is defined by Akerlof (1970) and expresses that because participants within a market possess imperfect information they are unable to fully evaluate the potential risks inherent in a transaction. Moreover, Akerlof (1970) outlines the principle of adverse selection which occurs when the debt issuer has more information than the investor, leading to moral hazard. Moral hazard occurs when the issuer exploits this market inefficiency to gain financial exposure recognizing that the investor may not price the risk appropriately (Akerlof, 1970). Assuming investors are rational and risk averse CRAs are an essential aspect of the financial sector.

There are three major CRAs, Moody's Investor Services (Moody's), S&P Global (S&P) and Fitch Ratings (Fitch). Collectively they account for over 90% of the industry's market share. The industry currently uses an issuer-pays model, where CRA charge issuers for providing ratings. Concerns have been raised on the potential conflict of interest this model presents. Like most profit maximising businesses, CRAs aim to serve their clients, however this should not translate into pleasing them through favourably inflated ratings (Bae *et al.,* 2015).

Whilst CRAs were first established in 1909, they have only ventured into assigning emerging market sovereign ratings in the mid to late 90s (Kraussl, 2003). A sovereign credit rating in simple terms is an assessment of the relative likelihood that a sovereign state will default on its financial obligations (Cantor and Packer, 1995). It may be said that in the case of emerging markets these ratings are particularly important (Luitel *et al*., 2016).

The proportion of emerging markets in the total number of sovereign rated countries has increased dramatically since the 1990s (Gaillard, 2014). Globalization has presented investors with increased opportunity as many low to middle income countries now more than ever have access to international capital markets. However, the downside is that information pertaining to emerging economies has been categorized as less readily available, incomplete and sometimes unreliable. This places a crucial emphasis on CRA ratings to fill the information gap. To a large extent, these ratings direct capital flows and influence the borrowing costs debt issuers are obliged to pay.

However, it is arguable that the three major rating agencies have inadequately fulfilled their role in the past. The most recognizable incident of reference is the inflated ratings of the subprime mortgage securities which formed the foundation of the 2008-2009 global financial crisis (White, 2010). To make matters worse, according to White (2010) CRAs maintained investment grade ratings on Enron bonds 5 days prior to their bankruptcy in 2001. Likewise in 2008 Lehman Brothers' commercial paper also maintained investment grade status on the very same morning they declared bankruptcy. CRAs have also been blamed for exacerbating various financial crises in emerging economies such as the Asian financial crisis of 1997 and the Mexican crisis of 1994 **(**Kraeussl 2003, Larraín *et al.,* 1997). The criticism is based on the sentiment that rating action is procyclical with the tendency of lagging behind macroeconomic indicators thus unduly aggravating boom-bust cycles by further affecting the cost of borrowing (Ferri *et al.,* 2003). Moreover, CRAs are alleged to be unfairly stricter when rating emerging markets (Yalta and Yalta, 2018). Amstad and Packer (2015) express that emerging market ratings tend to be lower than ratings of advanced economies, yet argue that it cannot simply be reduced to discrimination. Consequently, the reliability and informational value of the assessments provided by CRAs is met with scepticism. This has prompted several lines of research.

A lower rating implies a higher probability of default and vice versa. It is then logical that issuers with lower ratings are required to pay higher rates as a risk premium to provide an incentive to investors (Boumparis *et al*., 2019). Bond interest rates and prices are inversely related. The expectation is that a positive/negative change in sovereign credit risk, which is reflected in ratings, will have a positive/negative impact on bond market returns. However, the reality is more convoluted.

Empirical evidence indicates an asymmetric impact between rating upgrades and downgrades, which denote positive and negative news respectively. Early on Hand *et al.* (1992) examined daily excess bond returns associated with announcements and variations to S&Ps credit watch list as well as rating changes by Moody's. The authors observed significant negative average excess bond returns for downgrades, but weaker positive average excess bond returns for upgrades (Hand *et al.* 1992). Cantor and Packer (1996) results revealed that changes in credit risk are followed by statistically significant bond yield movements in the a priori expected direction. Reisen and Maltzan (1998) using a similar technique find that negative rating announcements statistically increase sovereign bond yield spreads. Nonetheless, they do not attribute this response to rating agencies providing superior information to investors. The IMF (2010) detracts and finds that rating changes, in general, have little market impact, although, the paper mentions that crossing the investment grade threshold leads to statistically significant widening of Credit Default Spreads (CDS). Gonzalez-Rozada and Yeyati (2010) argue that credit ratings rarely anticipate macroeconomic changes, it is still debatable as to whether this forms part of their function. The results of the paper find that the market impact on bond spreads is mostly observed in periods leading up to credit ratings whilst the impact post the actual rating announcement is low (Gonzalez-Rozada and Yeyati, 2010). This could suggest markets are able to use macroeconomic data to accurately form rating predications.

Although technology has made macroeconomic data more accessible, Afonso *et al.* (2012) found little evidence of anticipation of rating announcements. If ratings are not anticipated this suggests the presence of an informational component that is not readily available until a rating is published. Alternatively, Afonso *et al.* (2012) argue that economic fundamentals are not fully discounted which results in revised valuations post rating announcements. Albeit Binici *et al.* (2018) provide evidence of a decline in the general significance of rating impacts on CDS post 2008 global financial crisis. This finding alludes to the fact that market participants have lost trust in ratings after witnessing the aftermath of the crisis.

Cantor and Packer (1996) find that the impact on spreads is much stronger for ratings that are non-investment grade. While Cavello *et al.* (2008) find that rating changes that crossover between investment and non-investment grade have no additional explanatory power, Jaramillo and Tejada (2011) take the debate further posing the question on 'Does Investment Grade Matter?'. They find that investment grade status reduces spreads by approximately 16% over and above what is provided by macroeconomic fundamentals. Where the effects of investment

grade status is prominent it is probably due to regulatory reforms as opposed to informational value.

Stock market returns are also sensitive to sovereign credit risk. Partly driven by the sovereign ceiling policy, which limits a corporate rating according to its domicile (Borensztein *et al*. 2013). The concept of the sovereign ceiling meant that a company could not have a better credit assessment than its government. Historically valuation methods have extensively represented government investments as risk free proxies. This logic is still theoretically sound but should rather be taken as an assumption. In time the application of the sovereign ceiling has proven to be inaccurate, thus abandoned. According to Cheikh *et al.* (2020), CRAs no longer enforce the policy, however its legacy is still apparent especially in emerging markets. For instance Almeida *et al.* (2017) observed imposed sovereign ceilings on the ratings of large corporates in 80 countries regardless of their financial characteristics. An imposed rating ceiling determines a company's costs of raising capital and to an extent limits its financial performance.

Moreover, companies do not exist in a vacuum and are reasonably affected by macroeconomic indicators that inform sovereign credit ratings. The efficient market hypothesis argues that stock prices adjust immediately to reflect all available information (Fama 1970). To that effect Pukthuanthong-le *et al.* (2007:47) find that "rating agencies provide financial markets with new tradable information." It is therefore expected that a positive/negative change in sovereign credit risk will have a positive/negative impact on stock market returns respectively. However, there is competing evidence. Brooks *et al.* (2004) indicate that rating upgrades have an insignificant impact on returns while downgrades have a significant negative effect on returns. Similarly, Dichev and Piotroski (2001) find no response from upgrades but record negative abnormal returns following Moody's downgrades. Dichev and Piotroski (2001) assert that markets underreact to ratings and in the long run negative returns are triggered by earnings reports and not necessarily because of lower sovereign ratings.

Some studies do find evidence of positive returns associated with upgrades. Studies such as Hand *et al.* (1992), Kaminsky and Schmuckler (2002), Michaelides *et al.* (2012) and Safari and Ariff (2015) observe both negative and positive market effects although upgrades present significantly weaker average abnormal returns in comparison to downgrades.

Pukthuanthong-le *et al.* (2007) examine the impact of ratings outlooks and report that downgrades noticeably affect returns in both stock and bond markets, while upgrades show some evidence although insignificant. More recently, Mutize and Gossel (2018) examine the influence of sovereign credit ratings on bond and stock markets in 30 African countries and find that financial markets are non-responsive to sovereign rating changes. This result may be because African markets are already perceived to be risky. The existing literature is not clear what informational value ratings hold especially for emerging markets.

Furthermore, there is no consensus on whether sovereign credit ratings have a disproportionate impact between markets. Kaminsky and Schmuckler (2002) put forward that lack of transparency in many emerging economies is a key contributing factor for the high level of impact observed from rating changes. Brooks *et al.* (2004) disagree observing no particular sensitivity with regards to emerging markets. Afonso *et al.* (2012) find that the impact of sovereign credit ratings on advanced and emerging markets is similar, with one exception that emerging bond markets were non-responsive to positive rating events, whereas bond markets in advanced economies were responsive.

An important question is whether or not it matters who is providing the rating. Intriguingly, the market reaction observed is not consistent for all the CRAs. Hill and Faff (2010) through event study analysis address the question of whether any particular CRA exerts a greater influence on stock markets after allowing for sovereign and rating specific variables and a background of macroeconomic effects. The results of the study showed that Moody's triggered a significantly weaker response to a downgrade announcement in comparison to Fitch or S&P, while S&P ratings seem to be the most influential across emerging market countries (Hill and Faff 2010). Similar results were found by Brooks *et al.* (2004). Afonso *et al.* (2012) bring about two important considerations in their research. Firstly, that sovereign yield spreads respond far greater towards announcements from S&P in comparison to that of Moody's. Secondly, that these inconsistencies are likely due to differences in timing among the major agencies, with S&P announcements often preceding the other agencies (Afonso *et al.* 2012). This may imply that role of rating agency is dependent on who is the foremost to make an assessment which may be an interesting aspect to explore.

This study aims to add to the body of literature concerning the informational value of sovereign rating assessments in emerging markets. There are two main contending views. One view is

that CRAs only have access to publicly available information and lag the financial markets in processing this information, thus having little influence on market returns. The opposite view is that CRAs are highly specialised in interpreting and assessing creditworthiness and produce highly informative content. The output of this expertise thus significantly impacts financial market returns. This research is of direct interest to emerging market participants seeking international diversification and useful for making asset allocation decisions. Financial market policy practitioners may also find the results to be of value. To the best of our knowledge, this study offers a unique data sample.

1.2. GOALS OF THE RESEARCH

- The aim is to estimate the relationship between various sovereign credit rating announcements, and bond and stock market returns.
- To examine the extent to which sovereign credit ratings have a differential impact between bond and stock market returns.
- To examine if there are differences in the impact of rating announcements by different agencies on bond and stock market returns.

The first objective explores the informational value of ratings and other published announcements in light of sovereign credit risk and how financial markets respond to each sovereign credit rating change. The second objective builds on the assumption that the effects of ratings announcements on bond and stock markets are different. What may be bad news for bondholders doesn't necessarily imply the same for stockholders. If there is a difference, there will be implications on how investors and portfolio managers decide on asset allocation. The third objective addresses the differences in the credibility of ratings announcements by the three major CRAs, to answer the question does it matter who provides the rating.

1.3. METHODS AND ETHICAL CONSIDERATION

The study analyzed how bond market returns, as well as stock market returns, react to sovereign credit ratings. The study period spans from 2009-2019 to provide the latest available dataset. All data collected is of daily frequency time series nature. Sovereign credit rating history was collected in text format. Other variables include 10 year sovereign bond yields and stock

indices returns as a percentage using closing prices. All variables are publicly available and were sourced from the websites of CRAs, Thompson Reuters and Equity RT databases.
A total of 24 emerging markets were considered, its expected that ratings in these countries change more frequently and hold higher informational value given the stylized facts. The list of countries considered is adopted from the Morgan Stanley Capital International Emerging Market Index. Rating events of S&P, Fitch and Moody's were examined, because of their combined large market share the study has analysed the rating industry thoroughly. No ethics application form was submitted using the ethical review application system(ERAS) as this is low risk desktop research.

The research made use of a standard event study methodology. Event studies are able to capture dynamic effects, they can also exhibit evidence of whether rating agencies act with procyclicality, as well as underline whether ratings have sustained or merely temporary effects (Kaminsky and Schmuckler, 2002). To observe the effects of a rating event, measurement of abnormal returns within the specified windows was required. Abnormal returns refer to deviations in excess of their normal/expected return. Construction of event windows is similar to the structure applied in Afonso *et al.* (2012) and Safari and Ariff (2015) which sufficiently avoids issues of contamination with other concurrent market announcements which may prejudice the results. Results are partitioned from the sample into finer groups as recommended by Hooper *et al.* (2008).

1.4. ORGANISATION OF THE THESIS

This thesis is organized as follows. Chapter 2 discusses the current knowledge relevant to sovereign credit ratings in the form of a literature review. Chapter 3 outlines the data, methodology and techniques employed to conduct the research. Chapter 4 presents and discusses the results of the research conducted and compares the findings to previous literature. Chapter 5 concludes with a summary of the thesis and provides recommendations for future research.

CHAPTER 2: LITERATURE REVIEW

2.1. INTRODUCTION

This chapter examines and reviews the literature concerning and relating to sovereign credit ratings. Research concerning credit ratings has often been motivated by the controversy of the role played by rating agencies in the financial markets. The body of existing literature mainly focuses on answering two questions. Which factors determine credit ratings? And what is the impact of rating changes on bond and stock markets?

This chapter begins with a brief discussion on the emergence and evolution of credit ratings and their role. Section 2.3 outlines key concepts and the criteria used when rating agencies formulate sovereign credit ratings. Section 2.4 surveys literature concerning the impact of sovereign credit ratings on the bond and stock market respectively. Key findings and theoretical rationales are highlighted. This includes examining all types of credit rating announcements, the emphasis on investment grade ratings and differences between the three major rating agencies. The chapter concludes with a summary of the main findings from the literature.

2.2. HISTORY AND ROLE OF CREDIT RATING AGENCIES

2.2.1 History

The systematic collating and processing of data relating to creditworthiness by agencies can be dated as early as 1841 (Carruthers, 2013). Today the credit rating industry is dominated by three big players, Moody's, S&P and Fitch. Moody's is one of the oldest rating agencies established by John Moody in the 1900s. Moody's has been providing analysis on investment securities since 1909 and was the first to rate public market securities, in particular publishing ratings of railroad industry bonds. Poor's Publishing Company began issuing ratings in 1916, Standard Statistics Company started in 1922, the two then merged forming Standard & Poor's in 1941. Fitch Publishing Company started issuing ratings in 1924 (Cantor and Packer, 1995). According to Bhatia (2002), Moody's issued its first sovereign credit rating before World War I. Thereafter United States of America (USA) capital markets experienced rapid expansion during the 1920s which amounted to an increasing number of sovereign bond issues. This then led to a growth in the number of sovereign bond ratings. However, before 1990 rating agencies were largely focused on industrialized countries.

Years preceding 1975 Australia, Canada and the USA were the only countries rated by Moody's, while S&P mainly focused on rating Canada and the USA (Bhatia, 2002). Although credit rating agencies have long been established, they have only recently ventured into providing sovereign ratings for emerging markets (Kraussl, 2003). The use of credit rating services expanded exponentially largely due to the globalisation of financial markets with investors in pursuit of international diversification. Emerging markets are regarded as a unique opportunity for substantial gains however the risks involved are difficult to quantify.

Typically, information pertaining to emerging countries is less readily available, incomplete and sometimes unreliable. Such factors substantiate the business case for rating agencies. Increased complexity of financial products and heightened financial regulation are other key drivers of rating demand. The momentum for emerging market sovereign credit ratings increased significantly since 1989 (Reizen and Maltzen, 1999; Mellios and Paget-Blanc, 2006). Investors have a strong preference for rated securities in comparison to unrated securities, especially in emerging markets (Erdem and Varli, 2014). Jarmillo and Tedja (2011) argue that international drivers such as liquidity and risk appetite largely influence the borrowing costs of emerging markets. Higher ratings enable a sovereign to reduce its borrowing costs as well as attract foreign capital inflows.

2.2.2 Role of Credit Rating Agencies in International Financial Markets

To understand the role of CRAs it is imperative to start by assessing one of finance's earliest issue of information asymmetry. The concept of asymmetric information is defined by Akerlof (1970) to mean that participants within a market possess imperfect information and are unable to fully evaluate the potential risks inherent in an investment. Moreover, Akerlof (1970) outlines the principle of adverse selection which occurs when one party (the issuer) has more information than the other (the investor) leading to market failure- what has been popularly called the market for lemons. The presence of information asymmetry and adverse selection may lead to poor investment decisions. In order to make informed decisions, an investor will have to not only understand the returns but have a good appreciation of the associated risk.

Carruthers (2013) distinguishes between conditions of uncertainty and risk. Conditions of risk refer to when an investor does not know what future events may occur but is aware of the probabilities, whereas uncertainty means the investor has minimal information. Carruthers

(2013) argues that for a rational investor to maximize utility they will attempt to move away from uncertainty and closer towards risk when making decisions. Assuming investors are rational and aim to avoid moral hazard the argument for CRA is very compelling. S&P (2020) emphasis that credit ratings are not a guarantee or absolute measure but an important instrument in decision making.

Eaton *et al.* (1894) indicate that a lender desires to gather as much information as possible to avoid entering a financing relationship with a borrower who cannot service their debt. Borrowers will often know more about their own attributes which speak to their creditworthiness than lenders. To reduce this information asymmetry large financial institutions such as banks and insurance companies make use of both ratings from agencies and in-house credit models. Smaller institutions, firms and non-specialist lenders are likely to rely on CRAs assessments (White, 2002). In short, the primary role of CRAs is to reduce asymmetric information between the parties in a lending relationship (Ligeti and Szorfi, 2016).

Information contained in a rating drives the costs of borrowing as well as the direction of capital flows. Theoretically, issuers with lower credit ratings have to pay higher interest rates to provide a risk premium in comparison to higher rated issuers. This directly impacts the ability of an issuer to raise capital. Subsequently, credit ratings determine the eligibility of financial instruments for the portfolios of institutional investors who are prohibited from holding non-investment grade securities. Not only are credit ratings employed to assign the risk weights determining minimum capital requirements for different categories of borrowers (Elkhoury, 2009). Ratings are also employed by central banks to set standards for what is deemed acceptable collateral (Kiff *et al.,* 2012). In essence credit ratings agencies play a pivotal role in the allocation of capital in financial markets. Investors are discouraged by lower ratings and similarly higher rated entities can borrow easily at a lower cost. Therefore, countries with lower ratings have limited access to international and domestic capital.

CRAs have gained a considerable amount of attention and criticism on the role they assume. The failure of rating agencies to provide the necessary cautioning prior to the 1994-1995 Mexican, 1997-1998 Asian crisis, bankruptcies of Enron, Worldcom and Parmalat have brought into question the informativeness of credit ratings (Elkhoury 2009, Mora 2006). Likewise, favorable ratings from the major agencies played a vital aspect in the sale of the

securities based on subprime residential mortgages which formed the foundation of the global financial crisis of 2008 (White, 2010).

One can also add the Russian financial crisis of the late 1990s and the European debt crisis post 2008 to the list of questionable periods where credit ratings may not have played their role sufficiently or at least timeously (Haspolat, 2015). The latter is premised on findings that rating action is procyclical with the tendency to lag behind macroeconomic changes thus affecting the cost of borrowing and unduly aggravating boom-bust cycles (Ferri *et al.,* 2003). According to Pretorius and Botha (2017), three major rating agencies act in a procyclical manner when assessing African countries.

CRAs have also been found to be biased in favour of their home countries to the detriment of emerging markets (Luitel 2016, Tennant *et al.,* 2020). Gültekin-Karakaş *et al.* (2011) provide findings that demonstrate credit rating agencies acting unfairly stricter when assigning ratings to emerging markets than when rating advanced economies. While this bias may be a result of stereotypes formed from experiences, Mutize and Gossel (2019) postulate that investors are often very suspicious of new information reported by African countries. This distrust is owing to transactional lags, information asymmetry and lack of transparency. Consequently, investors resort to reliance on specialist information provided by agencies in emerging markets. Amstad and Packer (2015) convey that emerging markets are often rated on average one notch below their deserved level even though they disagree with the notion that rating agencies are biased.

Rating agencies reaction to macroeconomic developments is disproportionate between upgrades and downgrades, suggesting that downgrades are procyclical in nature and upgrades exhibit stickiness (Broto and Molina, 2016). According to Broto and Molina (2016:207) “once a country loses its rating level it takes a long time to recover it.” Broto and Molina (2016) argue that countries that have been downgraded have little capacity to alter their grade promptly through improving economic fundamentals. Whilst deteriorating economic performance in most cases speeds up the downgrade cycle, economic improvement does not speed up the upgrade cycle. Emerging economies are aware of this phenomenon and the consequences of losing investment grade status. So, in an effort to avert a downgrade they may adopt austerity reforms, hindering growth prospects. If emerging markets are unfairly discriminated against such measures become counter-productive and reinforce negative economic shocks in developing regions.

2.2.3 Conclusion

Credit Rating Agencies seek to reduce information asymmetry between parties in a lending relationship. These agencies are powerful institutions with the ability to greatly influence debt issuers access to funding and the costs thereof. With power comes great responsibility. Contrary to expectation credit rating downgrades have often not preceded financial crises. Hence, they have become subject to criticism. Partly because it is perceived that some of the financial crisis losses could have been avoided with the appropriate rating signals. The aftermath of these crises has resulted in a reputational decline. Nonetheless, credit rating agencies remain an integral part of the financial market.

2.3 SOVEREIGN CREDIT RATINGS

Having considered the history and role of CRAs it is logical to now understand the ratings themselves, in particular sovereign credit ratings. Sovereign credit ratings determine not only the terms but also the extent a country can access international capital markets. Given that some of the largest debt issuers are governments, sovereign ratings are a key consideration. This section discusses the various types of sovereign rating announcements and briefly outlines the criteria and methodology employed when rating agencies develop credit opinions.

2.3.1. Types of Sovereign Rating Announcements

A sovereign credit rating may provide to the investor an indication and information on the risks associated with debt. Sovereign credit ratings in simple terms are assessments by agencies of the relative likelihood that a sovereign government will default on its financial obligations (Cantor and Packer, 1996). Erdem and Varli (2014:42) define sovereign credit ratings as “an assessment allocated by rating agencies regarding financial and economic obligations of a specific country.” Bhatia (2002) refers to sovereign credit ratings as an indication of the capacity and willingness of rated governments to repay commercial debt obligations in full and on time.

Whilst sovereign and country risk are related, they are distinct concepts. The former refers to the risk of a sovereign government becoming unable or unwilling to meet its financial obligations. The latter refers to the risk linked to conducting business within the borders of a particular country.
Sovereign credit ratings are distinguished between foreign or local currency. Intuitively foreign currency ratings refer to the credit risk associated with debt issued in foreign currency. Local currency ratings refer to debt issued and payable in the domestic sovereign currency (FitchRatings, 2020). According to Cantor and Packer (1995), foreign currency ratings are more prevalent and exert more influence in the international bond market.

CRAs do not only assign actual ratings but equally announce watchlists, reviews and outlooks. Watchlists and outlooks serve to supplement the rating assignments by providing information on future ratings. Moody's (2020) equivalent to a watchlist is a rating review. A watchlist or rating review indicates that a rating is under consideration and may change in the short term, which is usually within 30 to 90 days on average (Bannier and Hirch, 2010). Moody's (2020) defines a rating outlook as an opinion regarding the probable rating direction over the medium term. There are four rating outlooks; positive, negative, stable and developing, it is also possible for an entity to have no outlook. A positive, negative or developing outlook suggests a higher chance of a rating change over the medium term. A stable outlook suggests that the rating will not change over the medium term. These complementary announcements have grown in importance and have become instrumental for investor decision making (Bannier and Hirch, 2010).

2.3.2 Criteria and Methodology

A sovereign credit rating is provided in the form of an alphabetic symbol, which can be translated into a probability of default. S&P and Fitch currently make use of the same credit grading scale. Moody's scale differs slightly, however, each symbol has an equivalent counterpart which allows for easy comparison between all three major agencies. Table 1 below displays the rating scales of the three major credit rating agencies. If a sovereign receives a Aaa by Moody's or AAA by S&P and Fitch it implies that the risk associated with the sovereign is relatively low and the corresponding probability of default is low. Currently, this is the highest rating an issuer can obtain. Lower ratings imply increased risk as well as probability of default. The lowest ratings being C and D which indicate that the issuer is in default or is very

likely to default. Ratings can be further classified into two groups investment and non-investment grade. Non-investment grade bonds are also referred to as junk, speculative or high-yield bonds. Referring to Table 1 these bonds are rated Ba1 , BB or below (Arnold, 2010).

Qualitative and quantitative factors are considered when assigning a rating. Agencies do not explicitly state how these ratings are determined, but broadly mention some of the criteria. Each entity is rated according to its specific merits and context within the rating framework. Methodologies are made publicly available and will often incorporate a scorecard that references which factors are most important for an assessment (Moody's, 2020).

Table 1: Credit Rating Agency Rating Scales

	Moodys	**S&P**	**Fitch**	**Description**	
1	Aaa	AAA	AAA	Highest credit quality	Investment Grade
2	Aa1	AA+	AA+	Very high credit quality	
3	Aa2	AA	AA		
4	Aa3	AA-	AA-		
5	A1	A+	A+	High credit quality, strong payment capacity	
6	A2	A	A		
7	A3	A-	A-		
8	Baa1	BBB+	BBB+	Good credit quality, adequate payment capacity	
9	Baa2	BBB	BBB		
10	Baa3	BBB-	BBB-		
11	Ba1	BB+	BB+	Likely to fulfil obligations, ongoing uncertainty	Speculative Grade
12	Ba2	BB	BB		
13	Ba3	BB-	BB-		
14	B1	B+	B+	High credit risk	
15	B2	B	B		
16	B3	B-	B-		
17	Caa1	CCC+	CCC+	Very high credit risk	
18	Caa2	CCC	CCC		
19	Caa3	CCC-	CCC-		
20	Ca	CC C	CC C	Near default with possibility of recovery	
21	C	SD D	DDD RD D	Default	

Source: Author compiled

Kraussl (2003) identifies two important themes which explain how these factors are assessed. Firstly there is an element of economic risk considered mainly through interpretation of the macroeconomic and finance fundamentals. S&P (2017) assessment labels read Economic, External, Fiscal and Monetary assessment as headings of their key factors. Macroeconomic

performance, public finances and external finances form part of FitchRatings(2020) analytical pillars of assessment.

The second essential component in determining sovereign risk is political willingness (Kraussl, 2003). Unlike corporate issuers, it is immensely challenging to enforce repayment of a sovereign government. This makes the element of willingness particularly important when measuring the likelihood of default (Ligeti and Szorfi, 2016). It is assumed a sovereign government can initiate and implement economic reforms (e.g tax reforms) to improve its ability to meet financial obligations if it has the political will. This is acknowledged by rating agencies and incorporated in their methodologies. S&P (2017) perform institutional assessments while FitchRatings (2020) mention that structural features, polices and prospects are pillars in its analysis. Generally, the criteria employed in credit assessments across the industry appear to be similar.

The criteria disclosed by rating agencies is rather vague and broad. Hence various studies have sought out to identify and quantify the determinants of ratings. Cantor and Packer (1996) outline six determinants; per capita income, GDP growth, inflation, external debt, level of economic development and default history. Mellios and Paget-Blanc (2006) highlight the significance of corruption as measured by Transparency Internationals Corruption Perceptions Index as a proxy for governance. Jaramillo (2010) names a handful of variables that determine investment grade ratings in emerging markets; external public debt, domestic public debt, political risk, exports, and financial depth. Similarly, an emerging market study by Erdem and Varli (2014) concludes that budget balance, GDP per capita, governance indicators and reserves are the most relevant factors for ratings assigned by S&P. More recently, Osobajo and Akintunde (2019) critically investigate 20 emerging markets using S&P and Moody's ratings and identify world governance indicators, a proxy for political variables, as crucial factors in determining a rating.

2.3.3 Conclusion

Overall the empirical evidence concerning determinants of sovereign credit ratings confirms the overarching aspects disclosed by the rating agencies. A sovereign credit rating is determined by a combination of economic and political indicators. Most if not all of these indicators are made publicly available and have become more accessible with the advancement of technology. Researchers acknowledge the increase in accessibility but advise that data can

be noisy and difficult to interpret. Specialists such as CRA have the ability to package the data in clear message through ratings. It remains a contentious subject whether or not sovereign credit rating announcements provide new information to the market, and to what extent ratings are valuable.

2.4 IMPACT OF SOVEREIGN CREDIT RATINGS

2.4.1 Introduction

The arrival of new information in the market should be incorporated into asset prices and valuations timeously (Fleming and Remdona, 1997). If sovereign credit ratings merely reflect existing information, the market and asset prices should not respond to any rating changes. Alternatively, if sovereign credit ratings provide new tradeable information the hypothesis is that a rating change will impact bond and stock returns. This section uncovers prior findings concerning the impact and influence of different types of rating announcements and changes. Findings with regards to investment grade rating changes are also discussed. Researchers have measured the informational value of rating announcements using a wide range of techniques. For the purposes of this review special focus is placed on previous event methodology studies. Beginning with 2.4.2 Bond Markets and Credit Ratings as it is expected that sovereign ratings directly influence bond prices, followed by 2.4.3 Stock Markets and Credit Ratings.

2.4.2 Bond Markets and Credit Ratings

Transactions performed with long-term undertakings of financial securities make up the bond market, terms such as debt, credit or fixed-income are also used to describe the bond market. There are five broad classes of issuers in the bond market, we focus on the largest issuer being governments. Sovereign or government bonds are interchangeable terms (Els *et al.,* 2014). Bond returns are mainly dependent on, the real interest rate, the expected inflation rate, interest rate risk, liquidity and importantly default risk. A bonds price is dependent on its nominal value, coupon rate, maturity and yield to maturity (Els *et al.,* 2014). Default risk of a government bond can be measured using a sovereign credit rating. Sovereign credit ratings largely determine a country's cost of borrowing in the international capital market. As mentioned, a lower rating implies a higher probability of default and vice versa. It is then logical that issuers with lower ratings are required to pay higher rates (credit risk premium) in

order to provide an incentive to investors (Ferri *et al.,* 2003). Els *et al.* (2014) define yield to maturity as the prevailing interest rate required in the market. There is an inverse relationship between bond yield to maturity and price. The expectation is that a positive (negative) change in sovereign credit risk, reflected by ratings, has a positive(negative) impact on returns.

2.4.2.1 Watchlists, Reviews and Outlook Announcements

Cantor and Packer (1996) find that the impact from negative outlooks and watchlist announcements is statistically insignificant whilst, positive announcements of the same categories were significant. This asymmetric response is rather difficult to interpret. This is not the only paper that reports asymmetric results. Hand *et al*. (1997) examine two types of announcements, additions to S&P credit watch list and rating changes by Moody's and Fitch. Their results indicate that additions to the credit watch list had an insignificant effect on average excess bond returns. Hand *et al.* (1997) upon dissection of the results reveal that when an addition to the watchlist is unexpected there was evidence of a significant negative average excess bond return associated with a signaled downgrade and similarly a positive average excess bond return associated with a signaled upgrade. This implies that investors create expectations around yields to maturity and at times anticipate announcements by CRAs.

In line with Cantor and Packer (1997) findings Pukthuanthong-Le *et al.* (2007) confirm evidence of a significant positive impact on bond returns when the rating economic outlook is upgraded at the 5% significance level. In addition, they confirm significant evidence at the 10% level of a negative impact on bond returns when outlook is downgrade. Whilst their event study results oppose Cantor and Packer (1997) providing evidence of Credit Default Swap (CDS) spreads widening significantly following negative outlook announcements. Kiff *et al.* (2012) conclude that negative credit warnings such as reviews, watches and outlooks have a significant influence on bond markets.

Kaminsky and Schmukler (2002) examine sovereign bond yield spreads of 16 emerging markets, they find outlook changes to be at least as important as actual rating changes. Alsakka and Gwilym (2012) apply an ordered probit modelling approach to analyze sovereign watch and outlook signals from the three major CRAs. They provide that these signals reveal more private information to markets hence they have economic consequences. According to IMF (2010) and Kiff *et al.,* (2012) these rating signal events are more informative than the actual

rating changes, whereas Pukthuanthong-Le *et al.,* (2007) find them to be at least as important as rating changes.

2.4.2.2 Rating changes

In the case of actual ratings, evidence points to an asymmetrical response between upgrades and downgrades. A seminal paper by Cantor and Packer (1996) examines changes to bond yields spreads that follow advanced and emerging market sovereign credit ratings. The results of the study indicated that 63 percent of the movement in spreads is attributed to a change in sovereign risk announced by an agency. The paper provides evidence of a decline in yield spreads associated with upgrades. They find that CRA upgrade announcements have a strong positive market impact.

Hand *et al.,* (1997) report significant negative average excess bond returns associated with actual downgrades. Whereas positive excess average bond returns effects from upgrades were much weaker in comparison. This is a consistent theme in the literature. Hand *et al.,* (1997) observed that when concurrent announcements are removed the mentioned effects on returns disappear. Hand *et al.,* (1997) struggle to give reasons for the asymmetric impact. Alsakka and Gwilym (2012) propose that downgrades may be more informative because of the negative reputational effects for any rating agency that reports a deterioration in a borrower's creditworthiness too late. Gande and Parsley (2005) allude that there are greater incentives for debt issuers to leak positive information which diminishes the informational impact of a positive rating event. There is no clear discernible explanation in the literature for the lack of significance following upgrades.

Reisen and Von Maltzan (1999) emphasize three points from the results of their event study exploring the link between rating announcements and sovereign dollar bond yield spreads. Firstly, that rating events from each of the rating agencies generally did not produce statistically significant responses in yield spreads. Though once aggregated the effects on yield spreads are significant and in the expected direction, notably on emerging market bonds. That is a downgrade is followed by a widening in spreads and upgrades produce a narrowing of spreads. The second and third observations relate to anticipation or expectation partly driven by preceding rating announcements such as reviews. Downgrades that affirm reviews and outlooks widen yield spreads both before and after the rating change. Yield spreads begin to

converge before an imminent rating upgrade but after the actual announcement there is no significant evidence of a response. This confirms Alsakka and Gwilym (2012) view on the informativeness of preceding rating events. As per Kiff *et al.,* (2012), actual rating changes except for those that affect investment grade status generally do not significantly impact CDS spreads.

Pukthuanthong-Le *et al.,* (2007) report that bond market returns react only to sovereign credit ratings downgrade and no impact is observable following upgrades. Building on points raised by Reisen and Von Maltzan (1999), Pukthuanthong-Le *et al.,* (2007) elaborate meaningfully that there is a greater reaction to unexpected events. In this context, expectations are partly created by specific country characteristics. For example, countries with relatively stronger economies surprise financial markets when their sovereign credit rating is downgraded. It is also important to consider that investor sentiments vary over the business cycle (Riaz *et al.,* 2019). To expand on this thought, during an economic downturn rating upgrades are unexpected, hence likely to generate a notable market reaction.
In line with this logic, Ismailescu and Kazemi (2010) argue that there is strong anticipation particularly for bad news in emerging markets while good news is unexpected. Ismailescu and Kazemi (2010) combine S&P ratings and outlooks and classify them as either positive or negative rating events. Their event study findings contradict preceding papers and conclude that CDS spreads respond weakly to negative rating events, and stronger to positive rating events.

Afonso (2012) argues that economic fundamentals are not fully discounted by the market on a more permanent basis, hence negative rating events are unanticipated. They mention that the negative reaction of CDS spreads to negative news has increased since 2008. Interestingly, Afonso *et al.* (2012) after testing for differences between emerging and developed markets find that sovereign yield spreads respond negatively and weakly to positive announcements in emerging markets but not for developed countries in the sample.
Binici *et al.,* (2018) correspond and attribute contrasting empirical evidence to a failure to fully condition the credit status of sovereign bonds prior to the announcement. Binci *et al.,* (2018) find that after conditioning announcements according to their outlook both upgrade and downgrades induce a market response. Binici *et al.,* (2018) maintain that the informational value of an upgrade is stronger when the bond outlook prior an announcement is stable and

without watchlist status. The study reports that rating announcements are still statistically significant post global financial crisis however the magnitude of this significance is declining.

2.4.2.3 Investment vs non-investment grade

There is a notion that rating events may only matter if they affect the status of investment grade. Once more the literature is divided. Cantor and Packer (1996) bring to our attention that the impact of rating announcements on spreads is much stronger for changes below investment grade bonds. Hand *et al.* (1997) concur finding stronger effects for non-investment grade bonds. Cavallo *et al*., (2008) using a Hausman specification test and dummy variables explore the informational value between S&P investment and non-investment grade ratings. Interestingly Cavallo *et al*., (2008) find that rating changes from investment to non-investment grade and vice-versa have no additional explanatory power to all other rating changes. A shortcoming of their study is the sample size with only nine events modelled. IMF (2010) find rating changes in general to have a minor market impact, but rating changes that cross the investment grade threshold lead to statistically significant widening of CDS spreads. Similarly, Kiff *et al.,* (2012) find actual rating changes to be insignificant up until the rating change involves moving in and out of investment grade status. They add that this impact is a result of purchases and sales of assets forced by regulations. Jeon and Lovo (2013) express that there is no informational value added by CRAs if bond prices purely react through a regulation channel.

Jaramillo and Tejada (2011) take the debate further posing the question 'Does Investment Grade Matter?'. The study examines 35 emerging markets between 1997 and 2010. They find that investment grade status reduces spreads by approximately 36 percent above and beyond what is provided by macroeconomic fundamental indicators, with a 5-10 percent reduction following from upgrades for bonds above investment grade. Overall they conclude that investment grade status reduces financing costs significantly and induces institutional investment.

2.4.2.4 Conclusion

A common thread is that negative rating events impact the bond market more than positive rating events. Outlook, review and watch announcements seem to have a greater impact on bond market returns than the actual ratings, depending on timing. Actual rating downgrades

are statistically significant in resulting negative bond returns, while the impact from upgrades is much weaker. This could be a result of expectations formed around rating events, potential information leakages or timing between outlooks and rating changes. Another possibility could be that investors are more careful about potential losses than they are about gains of equal magnitude (Soroka 2006, Hull *et al.,* 2004). This behaviour is well documented in economics and can be explained by prospect theory (Kahneman and Tversky, 1979). Investment grade ratings do impact emerging bond markets. Regulatory measures are likely to be the source of investment vs non-investment significance rather than informational value.

2.4.3 STOCK MARKETS and CREDIT RATINGS

2.4.3.1 Bond News and the Stock Market

Whilst sovereign credit ratings are assessments of sovereign's debt, these ratings have an effect on the private sector in a number of ways. One of the reasons why emerging stock markets may react to sovereign bond changes relates to the difficulty in gathering reliable information (Martell 2005, Mutize and Gossel, 2019). Taking this into account stock market participants may rely on sovereign ratings in making investment decisions. In addition, although many agencies have altered their policy on enforcing sovereign ceilings, sovereign credit ratings remain significantly influential on corporate ratings particularly in emerging markets (Borensztein *et al.,* 2013). Adelino and Ferreira (2016) reveal evidence of a sovereign ceiling applying to bank ratings, which puts constraints on their lending supply ultimately impacting the country's economic health. Besides the limits on corporate ratings, governments may raise taxes and impose policy reforms to pay for the higher costs of borrowing triggered by downgrade (Kaminsky and Schmucker, 2002). This in turn reduces corporate profits and earnings. S&P (2009) impart that if there is reason to believe a company is dependent on a sovereign for factors affecting operational and financial performance rating opinions may be connected. This then impacts not only the government's ability to access and raise capital but also that of companies trading within its jurisdiction.

On the other hand, it is possible that sovereign rating downgrades have a positive implication for stockholders (Goh and Ederington, 1993, Barron *et al.,*1997, Holthausen and Leftwich, 1986). For instance, a sovereign credit rating change may prompt the re-weighting of asset allocation for a portfolio after assessing the risks, resulting in a wealth transfer from bonds to

stocks. Bearing this in mind, the efficient market hypothesis states that current asset prices incorporate all new and available information (Fama, 1969). Therefore, it is expected that new information is reflected by changes in discount rates, expected dividends, earnings, prices and ultimately stock market returns. New information can be classified according to how it will be received. Typically, a positive or upgrade announcement suggests good news whereas a negative or downgrade announcement suggests bad news.

2.4.3.2 Watchlists, Reviews and Outlook Announcements

In a similar manner to the bond market negative reviews, watches and outlook signals tend to have more influence over the stock market in comparison to actual downgrades (Paterson and Gauthier, 2013). While the observations following positive rating events of the same categories are erratic. Caselli *et al.* (2016) surprisingly find increased bank stock returns as a result of sovereign negative credit watches. Caselli *et al.* (2016) put forward a possibility that upon the announcement of the watchlist the market created expectations of a downgrade therefore in this context rendering the rating event as good news. Paterson and Gauthier (2013) find abnormal positive returns only in the event of stable reviews announcements. According to Paterson and Gauthier (2013), positive events hold less quantitatively relevant information. Likewise a IMF (2012) paper suggests that positive rating actions are more dependent on political factors hence the lack of market response.

Pukthuanthong-le *et al.*(2007) provide evidence of positive and significant market response to upgrades in outlooks only in the bond market and not the stock market. Their results show that the impact on stock returns from S&P outlook and watch events are stronger than actual rating changes. Hooper *et al.* (2008) report the outlook and watch impact to be double in magnitude in comparison to rating changes. In contrast, Hill and Faff (2010) argue that there is no evidence that prior indication such as credit watches lead to less market response. The study analyses mean-adjusted returns following both forewarned and non-forewarned rating changes. Hill and Faff (2010) suggest that the reason for differences in market response is because of untimely rating changes.

2.4.3.3 Rating changes

Studies that have examined the impact of rating changes on the stock market largely echo findings from bond market literature. A paper by Brooks *et al.* (2004) strongly influenced later developments on this topic of research. Brooks *et al.* (2004) investigate the impact sovereign credit ratings have on the United Kingdom stock market returns. Using an event study methodology, the paper indicates that rating upgrades have an insignificant impact on returns. Conversely, for downgrades there is a strong negative impact on returns (Brooks *et al*., 2004). Subsequently, many studies have reported similar asymmetric impact between upgrades and downgrades (Martell 2005, Caselli *et al.,* 2016). Researchers have made various attempts to explain this phenomenon.

Paterson and Gauthier (2013) find that actual downgrades and positive rating changes alone are insignificant. This is because of the market anticipation and discounting which occurs prior a rating change. According to Martell (2005), even if rating changes are anticipated they are not fully discounted because a level of uncertainty about the timing of an announcement exists. Michaelides *et al.* (2011) are of the view that information pertaining to ratings leaks before an announcement rather than market anticipation. This view is based on the finding that pre-event abnormal returns are mostly found in low institutional quality markets. The study raises concerns of about a lack of regulatory effectiveness in preventing possible information leakages. Furthermore, Michaelides *et al.* (2011) point out that at times there is an overreaction prior announcement resulting in a correction post announcement. This may explain why some studies report an insignificant impact from actual rating changes.

Kaminsky and Schmuckler (2002) find statistically significant evidence of rating change effects on stock returns in emerging markets. Plus, the findings signal outlook and actual ratings to be equally important. However, Kaminsky and Schmuckler (2002) conclude that ratings tend to be procyclical reinforcing investors' expectations. Indicating that this type of news is not very informative hence effects do not appear to be large in economic terms. Pukthuanthong-Le *et al.* (2007) study differs from Kaminsky and Schmukler (2002) considering a larger sample over a longer time horizon.

While Pukthuanthong-le *et al.* results mirror that of Kaminsky and Schmukler (2002) according to Pukthuanthong-le *et al.* (2007:47) "rating agencies provide financial markets with new

tradeable information." Both studies describe the importance of ratings in particular for emerging markets. Pukthuanthong-le *et al.* (2007) add that the impact of downgrades on stock returns are more pronounced where countries exhibit high inflation, low fiscal balance and local currency debt.

Similarly, Martell (2005) notes that companies listed in the poorer emerging markets experience a larger price impact from sovereign credit rating downgrades. Brooks *et al.* (2004) contrary to Kaminsky and Schumukler (2002) do not observe any particular sensitivity with regards to emerging markets, the former remarks that the significant negative impact from rating downgrades is relatively in line with that of advanced markets.

Mutize and Gossel (2019) contribute to the literature with a study examining long term foreign currency denominated bonds and stock markets in 19 African countries between 1994 to 2014. The results depict that sovereign credit ratings impact bond prices greater than stock prices. Albeit the study concludes that African stock market reacts negatively(positive) to sovereign credit downgrade(upgrade) events (Mutize and Gossel, 2019). Tahmoorespour *et al.* (2019) contribute a larger sample of G7 unstudied countries with a particular detail towards the impact on the banking industry. Overall the event study carried out show G7 stock markets to have an impulse reaction to sovereign downgrade news whereas the market response is smoother for upgrades.

2.4.3.4 Conclusion

Sovereign credit ratings provide investors insights into more than just the risk associated with the debt of a country. A sovereign credit rating also reveals information on companies listed on exchanges. For a number of reasons, a sovereign rating has an impact on a company's borrowing costs and ultimately financial performance. A rating event then triggers price adjustments to reflect all available and public information. There is evidence of a market response for positive and negative watchlists, reviews and outlook announcements. While the response to actual ratings is asymmetric, with strong significant negative abnormal returns associated with downgrades and insignificant positive returns linked with upgrades. Pukthuanthong-le *et al.* (2007) add that the impact of downgrades on stock returns are more pronounced where countries exhibit high inflation, low fiscal balance and local currency debt.

2.5. CREDIT RATING AGENCIES

The relevance of credit rating agencies (CRA) in emerging markets has grown substantially. At the core of the credit rating business lies values of credibility, integrity and reliability. Steiner and Heinke (2001) state that there is no reason to believe that there are reliability differences between the major credit rating agencies. If a material differential in reliability exists there is a possible moral hazard risk. Currently, CRAs make use of an issuer-pays model. This model may have its pitfalls presenting a possible conflict of interest. For instance, Steiner and Heinke (2001) provide that systematic leniency could occur when rating an issuer in order to gain market share. Doing so could harm an agencies reputation which could be detrimental to its survival. Intriguingly, Dimitrov *et al.* (2015) impart that rating agencies are not penalized for being pessimistically biased in their assessments. Rating opinions between the major agencies should ideally be impartial. Therefore, it is expected that the excess bond and stock returns associated with rating events are not dependent on any particular agency. However, in some cases this hypothesis has been rejected.

According to Cantor and Packer (1996), the impact of one rating agency announcement is greater if the announcement confirms and or validates the other agencies rating or previous rating announcement. To this point, researchers have raised concerns over this credit rating agency effect. Interestingly, Brooks *et al.* (2004) observe large differences in market reaction between the rating agencies in the study. Rating announcements by Moody's observed weaker impacts even on the downgrades. A paper by Govender (2018) which specifically focuses on BRICS nations is consistent with Brooks *et al.* (2004) finding S&P to have a greater influence on volatility and stock market returns respectively. Govender (2018) mention that the response from announcements from Fitch and Moody's were subdued.

Alsakka and Gwilym (2012) suggest that each agency has its own policy. According to Alsakka and Gwilym (2012), S&P is more oriented towards short-term accuracy, while Moody's has more emphasis on stability. The analysis reveals that S&P reverses its outlook more frequently than Moody's implying that S&P is the most independent. It appears the market recognizes S&P independence. Afonso *et al.* (2012) paper show an asymmetric market reaction to different firms. In their study sovereign CDS spreads increase when Moody's and Fitch announce negative news and decrease when S&P make a similar announcement. Afonso *et al.*

(2012) state that this response is likely due to timing differences between agencies with S&P mostly occurring before Fitch and Moody's downgrades.

According to Martell (2005), Moody's rating are considered less informative on emerging stock markets in comparison to S&P ratings. Mollemans (2004) research results mirror Martell (2005) findings and show that emerging stock markets only react to downgrades issued by S&P and not Moody's. Hill and Faff (2010) through event study analysis examine differences between agencies to determine whether any particular agency has more impact on stock markets after allowing for sovereign and rating specific variables and background macroeconomic effects. Hill and Faff (2010) confirm significant negative responses to downgrades/negative events in both crisis and non-crisis periods, with crisis periods having an amplified response. The study finds no conclusive evidence of a reputation effect, albeit Moody's observed a significantly weaker response to downgrade announcement than to Fitch or S&P downgrades, while S&P ratings seem to be most influential (Hill and Faff, 2010).

Paterson and Gauthier (2013) also examine the credit rating effect and find that S&P ratings had the greatest market impact of the three major agencies. However, they find no conclusive evidence to support a credit agency effect among the BRIC stock markets. This line of literature suggests that S&P holds a strong reputation among investors. Paterson and Gauthier (2013) report that S&P is generally the first one to confirm Fitch's announcements in the sample. This observation supports Hand *et al.* (1999) description of the importance of rating timing. Fitch tends to be the first of the three agencies to issue ratings, although it is the smallest and lowest in terms of rating announcements thus its ratings may carry less weight.

More recently Tran *et al.* (2019) contribute to the debate by pointing out that multiple rating agencies assess the creditworthiness of a larger issuer. Naturally, there will likely be information repetition within each agencies rating announcement. This raises the question of whether all sovereign credit rating announcements are informative. Tran *et al.* (2019) split announcements into two categories (a) those that reveal a new opinion about the issuer and (b) those that reaffirm prevailing opinions by other agencies. The paper concludes that both types induce a market response. The hypothesis is that opinions that follow the leading agency do not contain any new information but rather confirm beliefs, ultimately reducing uncertainty.

2.6 CONCLUSION

The history of credit ratings is long however the exercise of rating sovereign emerging market economies is relatively novel. It is without a doubt that sovereign credit ratings provide a critical service by reducing asymmetric information between parties in a lending relationship. Hung *et al.* (2019) describe rating agencies as important gatekeepers of the debt market. Over the years credit rating agencies have become subject to criticism due to the lack of signal prior various financial calamities. In addition, Amstad and Packer (2015) amongst others find that credit rating agencies are unfairly biased towards emerging economies.

The debate concerning the impact of the sovereign credit ratings is contentious. Cantor and Packer (1996) find that negative credit watch, review and outlook events have an insignificant impact on bond market returns. They do find evidence of an impact stemming from upgrades. In disagreement, Kiff *et al.* (2012) conclude that negative credit warnings such as reviews, watchlists and outlook changes have a significant influence on bond CDS spreads. Most studies highlighted report a larger bond market impact from rating downgrades, and much more muted response from upgrades. Regulatory provisions exacerbate the market response when a bond security loses its investment grade. In general rating events directly impact the bond market, however the magnitude of the impact is dependent on expectations. Rating events are particularly important for emerging market economies. For these economies access to international capital markets is precarious (Reinhart, 2002)

Sovereign credit ratings have an impact not only on the securities they are rating, but also on the stock market. Similar to the bond market the response to actual ratings is asymmetric. Studies often show strong significant negative abnormal returns associated with downgrades and insignificant positive returns linked with upgrades. The stock markets of poorer emerging markets experience a larger price impact from sovereign credit rating downgrades (Martell, 2005). According to Kaminsky and Schumukler (2002), there is no particular sensitivity with regards to emerging markets. In addition, the paper concludes that ratings tend to be procyclical reinforcing investors' expectations, therefore not very informative.

The literature survey identifies differences in reputation among the three major credit rating agencies. This is observable from the disparity in market response to rating events by each agency on bond and stock market returns. According to Alsakka and Gwilym (2012), each

agency has its own policy resulting in differences in rating announcement timing and frequency. Paterson and Gauthier (2013) find that S&P had the most influence of the three major agencies. Hill and Faff (2010) contend that each rating agency's influence is similar once allowing for sovereign and rating specific variables.

While the literature on the impact of sovereign credit rating changes on the bond and stock market is inconclusive there is a common theme surrounding market agents' expectations. It then follows that a sovereign downgrade(upgrade) does not necessarily result in a negative(positive) impact for the bond and stock market. Four main themes emerge from the literature. (a) Market expectations; the rating event was unanticipated and caught market participants by surprise prompting a sudden market reaction. Evidenced by more muted responses where actual ratings are preceded by reviews, watchlist and outlook changes. The reaction to sovereign rating events is more prominent for reviews, outlook and watchlist changes in comparison to rating changes. (b) Investment grade threshold; Rating events which determine a sovereign's investment grade status, result in significant market movements. (c) Reputation effects; The impact of sovereign rating events on bond and stock market returns varies in relation to the agency making the announcement. Results are qualitatively and quantitively different across all three credit rating agencies. It is important to account for announcements by competitors and the timing thereof. Rating agencies which hold a higher reputation among market participants invoke a greater response from rating events. Rating agencies compete based on credibility and aim to provide dependable rather than favorable opinions. (d) Positive rating events are not meaningful. Evidence of significant market reaction from upgrades is rare. Where evidence is found bond and stock markets react significantly more to negative than positive sovereign rating events.

CHAPTER 3: DATA, METHODOLOGY AND TECHNIQUES

3.1. INTRODUCTION

Chapter 3 begins by describing the event methodology undertaken along with a theoretical explanation of how the study will achieve its objectives. Followed by a paragraph mentioning which analyses will be performed on the resultant data. This chapter also indicates the research paradigm with an overview of the data, sample population sizes and how each was gathered.

3.2. EVENT STUDY METHODOLOGY

The analysis of the impact of sovereign credit ratings is performed using a standard event study methodology. Event studies have become a popular choice in financial literature for measuring security price reaction to economic news (Brown and Warner 1984, Binder 1998, Mallikarjunappa and Nayak 2013). Not only are event studies able to capture dynamic effects, reveal evidence of procyclicality, but also highlight sustained or merely temporary effects from news (Kaminsky and Schmuckler , 2002). In essence, an event study aims to distinguish between expected/normal returns and abnormal returns that result from a defined event. Event study literature features three commonly used equations to obtain abnormal returns. These include the mean adjusted model, market adjusted model and the market model. The market model is well-specified and most suitable for achieving our research objectives. The following section describes the full procedure carried out in performing this event study.

3.2.1 Event Definitions & Selection criteria

This research defines and limits events to actual sovereign credit ratings, outlooks, reviews and watchlists. The events of the study are confined to foreign currency sovereign credit rating announcements by Moody's , S&P and Fitch.

Calendar dates are transformed into a timeline following a linear chronological event time sequence (*see Figure 1*). Event time excludes weekends, holidays and any other periods where the bond and/or stock market is closed. The event day is represented by the number zero(0) and refers to the actual date of an announcement. In practice often rating announcements are published after the trading day close. Nonetheless the event windows described below make provision, and are sufficiently long enough to capture market effects from announcements post

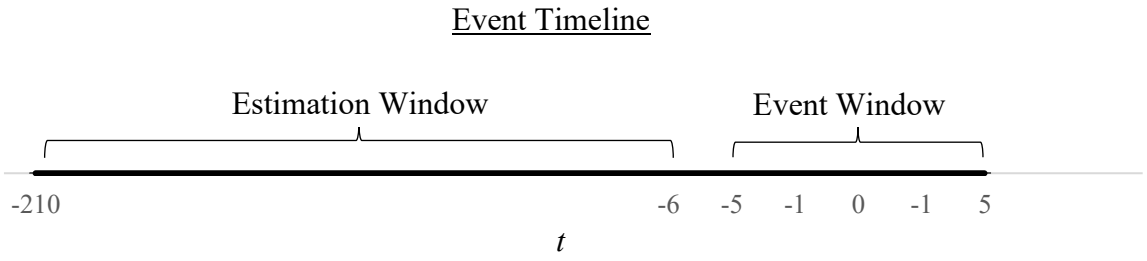
the trading day. For consistency across time zones all rating information is assumed to be made public at Time 00:00:00. In order for inclusion in the analysis there must be no missing market data for a minimum of 150 days before the event day, and 5 days post event day.

3.2.2 *Event Timeline*

A total of 215 days around the event were considered (*t*-210: *t*+5). Guided by a survey of event study literature in Chapter 2 this was deemed an appropriate length. As illustrated in Figure 1 below our event timeline consists of two parts, an estimation and event window. As the name suggests the estimation window estimates what the expected/normal returns would be in the if there was no event. During the event window we expect returns to deviate from the norm. Hence this partition prevents the impact from the event influencing the parameter estimates of the expected/normal returns.

Two event windows are observed, wide and narrow. The wide window is 11 days (*t*-5:*t*+5) including the event day *t-0*. The intention of wide window is to capture any anticipatory and/or lagged abnormal returns prior and post the event day. To mitigate the risk of contamination from undefined events a narrower window is necessary. We believe the most precise narrow window possible is 3 days long (*t*-1:*t*+1).

Figure 1.



Source:Author

3.2.3 *The Market Model*

The market model simply calculates the return of a given security in relation to its market return. Market return is used as a variable for normal/expected returns. This approach is a common and attractive choice in comparison to alternative models (Campbell *et al.,* 1998).

The calculation requires first obtaining various inputs, the steps carried out are as follows:

Equation (1) describes logarithm yield change of a sovereign 10-year bond (BY_{it}).

$$BY_{it} = \ln\left(\frac{Y_{it}}{Y_{it-1}}\right), \quad (1)$$

where

Y_{it} is the 10Y sovereign bond yield for sovereign *i* at time *t.*

Y_{it-1} is the 10Y sovereign bond yield for sovereign *i* at time *t*-1.

Equation (2) calculates the logarithm of returns for a sovereign stock market (R_{it}).

$$R_{it} = \ln\left(\frac{R_{it}}{R_{it-1}}\right), \quad (2)$$

where

R_{it} is the stock market closing price for the sovereign *i* at period *t*

R_{it-1} is the stock market closing price for the sovereign *i* at period *t*-1

An important aspect underlying time series data is stationarity. Augmented Dickey Fuller & Phillips-Perron stationarity tests were performed on the sample of returns obtained from equations 1 and 2, to ensure and confirm that our regression results are non-spurious.

Parameters for the market model were obtained through OLS regressions (3) and (4) over the estimation window preceding each event.

$$BY_{it} = \alpha_i + \beta_i B_{mt} + \varepsilon_{it} \quad (3)$$

where

α_i is the intercept coefficient,

β_i is the market benchmark coefficient

B_{mt} is the yield change of EMSBI at time *t*

ε_{it} is the error term with mean zero and constant variance over *t.*

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (4)$$

where

R_{mt} is the stock return of MSCI emerging market index at time *t.*

Abnormal returns were measured within the event window(s). Abnormal returns refer to deviations in excess of their expected/normal return (Fama *et al.,*1969). In the context of this research the expected/normal return refers to our selected market benchmark indices. Generally indices control for unrelated market wide factors. Reasonably the selection of the index is a crucial aspect to the design of any event study, as it may determine the results. Equation (4) is borrowed from Sharpe (1963) incorporating market risk when computing abnormal returns. The model parameters are taken from the estimated OLS regression(s) previously mentioned.

Abnormal market impact is specified as follows:

$$ABY_{it} = BY_{it} - \alpha_i - \beta_i G_{mt} + \varepsilon_{it} \quad (4)$$

where

ABY_{it} is the abnormal yield for sovereign *i* at period *t*

BY_{it} and G_{mt} are the returns of the event window(s).

$$AR_{it} = R_{it} - \alpha_i - \beta_i R_{mt} + \varepsilon_{it} \quad (5)$$

where

AR_{it} and is the abnormal returns for sovereign market *i* at period *t.*

R_{it} and R_{mt} are the returns of the event window(s).

Abnormal yields and returns are cumulated across the event window(s) to obtain Cumulative Abnormal Returns (CAR) [(*t*-5, *t*+5), (*t*-1, *t*+1)]. The rationale for CAR_{it} is to understand the total market impact during the event window(s) from the rating event.

$$CAR_{it} = \sum_{t=t_{-1}}^{t+1} AR_{it} \quad CAR_{it} = \sum_{t=t_{-5}}^{t+5} AR_{it} \quad (6)$$

3.2.4 *Testing framework*

We determine statistical significance of the results by computing the test-statistic which follows a t -distribution and assumes that abnormal returns are normally distributed. T-statistics of AAR_{it} and CAR_{it} require the mean and the standard deviation.

$$AAR_{it} = \frac{\sum_{i=1}^{N} AR_{it}}{n} \quad (7)$$

Where AAR_{it} is the mean abnormal returns in the event window,

$$\sigma AAR_{it} = \sqrt{\frac{\sum_{t=1}^{T}(AAR_t - \overline{AAR_{it}})^2}{(n-1)}} \quad (8)$$

σAAR_{it} is the standard deviation

$$t - stat = \frac{\mathrm{AAR_{it}}}{\sigma \mathrm{AAR_{it}}} \quad (9)$$

The t statistic of equation 9 is the ratio of the mean abnormal returns to the standard deviation from the time series of mean abnormal returns (Martell, 2005).

The testing framework investigates various aspects of the impact of sovereign credit ratings on bond and stock markets. Namely a general overview of rating changes, rating signals and agency specific effects. The hypothesis tested is that all sovereign credit rating events of all three CRAs have no significant impact on emerging bond and stock market returns.

To investigate the impact of rating changes, rating downgrades and upgrades were aggregated across all three agencies over the study period. The null hypothesis is that the abnormal returns are equal to zero. Assuming markets are efficient security prices should reflect all available information. Theoretically no market response should occur because credit rating opinions are informed by publicly available market data. The alternative hypothesis is that the abnormal returns are not equal to zero. Suggesting that sovereign credit ratings contain or are at least perceived to contain privileged information which influences returns when made public.

Following Binci *et al.* (2018) recommendation, to avoid misleading assessments we tested rating signals which may affect the abnormal returns prior a rating change. The null hypothesis is that abnormal returns are equal to zero for all rating signals. If we reject our null hypothesis, we can identify whether there is asymmetry in informational value between rating signals and rating changes.

It is valuable to test the impact from each of the three major rating agencies perspective. Investors seek quality ratings which are fair and accurate. Whereas credit rating agencies derive revenue from debt issuers who ideally prefer more favorable ratings. This raises a concern that competition may lead to compromised rating opinions, a concept covered extensively in

literature termed as the reputation effect. Here the null hypothesis is that abnormal returns are equal to zero irrespective of the specific agency. If we reject our null hypothesis this would imply a possibility of compromised integrity and lack of trust within the rating industry.

Equally it is imperative that the impact from losing and gaining an investment grade rating was assessed. The null hypothesis is that the abnormal returns are equal to zero irrespective of investment grade status. If we reject our null hypothesis this suggests market participants view investment grade ratings as particularly important when valuing emerging markets, this also highlights the regulatory impact.

3.3. DATA DESCRIPTION

Three data sets were collected: sovereign credit rating history, sovereign bond yields and stock market returns. A total of 24 emerging markets were considered. Sovereign credit rating history was sourced from the three major rating agencies namely Moody's, S&P and Fitch. Daily long-term bond yields and stock market returns time series data were obtained from Thompson Reuters Eikon and EquityRT. The two periods under study are 2015-2019 and 2009-2019 for the bond and stock market analysis respectively. Period lengths and number of emerging markets are mainly driven by the availability of data. This research is particularly interested in emerging markets, which are expected to have frequent rating changes as well as a good distribution between investment and non-investment grade ratings.

3.3.1 Sovereign Credit Rating History

Sovereign credit rating history was collected from 2009 to 2019 for 24 emerging markets across three credit rating agencies. Moody's, S&P and Fitch were selected because their industry dominance and historical reputation, the three agencies have become popular household names. This dataset is made up of sovereign long-term foreign currency announcements from the three major agencies. Announcements include ratings, outlooks and watchlist changes. Each rating symbol is assigned a numerical value, the highest being one and lowest twenty-one as can be viewed in Table 1. The numbering allows ratings to be comparable across each agency, as well as identify the magnitude of the rating changes. Each announcement was considered as an individual event unless multiple announcements occur within short intervals between one another. Where two or more rating announcements occur within ten business days between

each other they were considered as one combined event in the sample. Each announcement was categorized into groups according to type. Furthermore, announcements were labeled as either positive or negative news. Rating upgrades, positive and stable outlooks are generally considered as positive news. Downgrades, negative outlooks and negative watchlist announcements are labeled as negative news. Where two or more announcements have been combined into one event and conflict i.e positive and negative news, the event is excluded to avoid ambiguity.

3.3.2 *Bond Market Yields*

The bond market analysis sample consists of daily long-term sovereign bond yields from 2015-2019 for twenty emerging markets. All bond yield data is of 10-year maturity. Yields on longer term bonds typically 10 year are considered as proxies for investor sentiment (Lee and Kim, 2019). Emerging markets include; Brazil, Chile, China, Colombia, Czech Republic, Greece, Hungary, Indonesia, Malaysia, Mexico, Pakistan, Philippines, Poland, Qatar, Russia, South Africa, South Korea, Taiwan, Thailand and Turkey. Due to data constraints this research constructed its own benchmark index named EMSBI (Emerging Market Sovereign Bond Index). EMSBI is calculated as an equally weighted portfolio representing each of the mentioned emerging markets.

3.3.3 Stock Market Returns

The stock market sample is made up of daily stock exchange returns (using closing prices) for the period 2009-2019 for twenty-four emerging markets. All returns are denominated in US dollar currency. Criterion for selected sovereign stock markets is based on the Morgan Stanley Capital International (MSCI) Emerging Market Index. "The MSCI Emerging Markets Index captures large and mid-cap representation across 26 Emerging Markets (EM) countries. With 1,390 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each country" (MSCI Inc, 2020). This index is also our preferred benchmark to measure our market returns variable because of its strong reputation. Since its inception in 1988 the index has become one of the most commonly used indices in the global investor community (Hacibedel and Bommel, 2006). The emerging markets and respective stock market indices are listed in Table 2.

Table 2: Stock Market Data Summary

Emerging Stock Exchanges		
Country	**Continent**	**Equity Index**
Argentina	South America	MERVAL
South Africa	Africa	JSE ALL SHARE
Brazil	South America	BOVESPA
Russia	Europe/Asia	MOEX
India	Asia	S&P BSE SENSEX
China	Asia	SHANGHAI SHENZHEN CSI 300
Chile	South America	S&P IPSA CLP
Colombia	South America	COLOMBIAN CAPITALIZATION
Czech Republic	Europe	PX PRAGUE SE
Egypt	Africa	EGX 30
Hungary	Europe	BUDAPEST SE
Indonesia	Asia	JARKARTA SE COMPOSITE
South Korea	Asia	SE KOSPI
Malaysia	Asia	FSTE BURSA MALAYSIA KLCI
Mexico	North America	S&P/BMV LPC
Pakistan	Asia	KSE 100
Peru	South America	S&P/BVL PERU GENERAL
Philippines	Asia	PSEI
Poland	Europe	WARSAW SE WIG POLAND
Qatar	Middle East	QATAR EXCHANGE GENERAL
Taiwan	Asia	TAIWAN SE WEIGHTED
Thailand	Asia	SET
Turkey	Europe/Asia	BIST100
UAE	Asia	Abu Dhabi Securities Exchange
-	-	MSCI EM

Source: Author

3.4. CONCLUSION

Chapter 3 discussed the event methodology used and details its construction with the aid of an event timeline diagram. The advantages of market model selected are stated with reference to the literature review in Chapter 2. Thereafter an explanation of the model specified was provided, as well as a description on how the research objectives set out in Chapter 1 are addressed. In addition, Chapter 2 outlined and described the characteristics of the data collected in order to carry out the market model, as well as the relevant sources. Daily sovereign credit rating history was sourced from Moodys, S&P and Fitch. Emerging bond market yields and stock prices were collected Thompson Reuters Eikon and Equity RT. The results obtained from the method laid out in Chapter 3 are presented in Chapter 4.

CHAPTER 4: EMPIRICAL RESULTS

4.1 INTRODUCTION

Chapter 4 presents the results of the market model tests conducted as described in the previous chapter. Emerging bond and stock market abnormal returns surrounding sovereign credit ratings are analyzed econometrically. To facilitate presentation the mean results of each event window are reported. Where necessary and valuable for interpretation, abnormal returns for each event day are mentioned. Also, graphs are drawn to illustrate the relationship between abnormal returns and each rating announcement. Due to differences in samples, this chapter is split into two parts. Section 4.2 discusses the results of each event study analysis conducted using bond yields. Thereafter the results of event studies using stock market returns are presented in section 4.3. Section 4.4 summarizes and compares the results of this study with that of previous literature.

4.2. EMERGING BOND MARKET YIELDS

4.2.1. Impact of Rating Changes

Table 3, panel A presents the results from event studies using rating changes from three credit rating agencies. The null hypothesis is that AR are equal to zero because rating changes do not reflect new information. A total of 50 events are analysed, of which 29 are rating downgrades and 21 are upgrades. AR signs indicate that sovereign bond yields react positively to rating downgrades and negatively to upgrades. The magnitude of the impact is greater following rating downgrades more so observing CAR values. There are no significant AR results for the wide and narrow windows. Both the 11 and 3 day downgrade cumulative abnormal returns (CAR) are positively significant at the 5% level. In line with Pukthuanthong-Le *et al.* (2007), we find no evidence of significant AR nor CAR in response to rating upgrades.

Table 3: ***Bond Market Abnormal Returns Analysis***

Panel A: 10Y Bond Yields using Rating Changes						
Rating	Events	Window	AR	t-stat	CAR	t-stat
Downgrade	29	(-5:5)	0.0007	0.2179	0.0082	2.3971**
		(-1:1)	0.0016	0.9607	0.0047	2.8821**
Upgrade	21	(-5:5)	-0.0005	-0.1274	-0.0054	-1.3201
		(-1:1)	-0.0009	-0.1579	-0.0026	-0.4736
Total	50					

Note: Probability t-distribution *, **, *** denote statistical significance at 10% ,5% and 1% levels, respectively.

Emerging Market 10Y Bond Yield Abnormal Returns

Figure 2

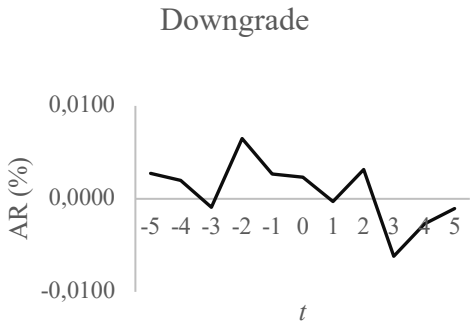
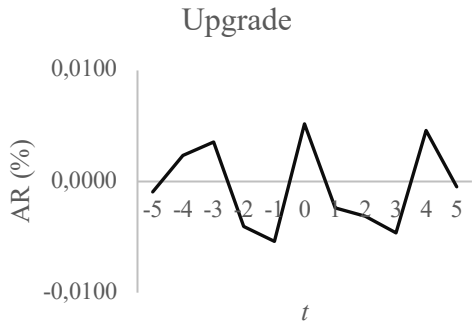


Figure 3



Source:Author

Figures 2 and 3 illustrate daily AR for the 11 day event window. It appears that sovereign credit ratings impact emerging market bond yields at two points. Before and after the announcement day *t*-0 AR move in the predicted direction of the associated rating change. For rating downgrades, it takes a day after announcement for AR to rise, while for upgrades the reaction is immediate.

Table 4 below presents the results of the event studies using rating changes from Moody's, Standard and Poor's (S&P) and Fitch respectively. The null hypothesis is that AR are equal to zero irrespective of the specific agency, if not this will imply differences in reputation among the agencies. Contemporaneous announcements are excluded to isolate the impact from each rating agency. A sum of 42 rating changes are analysed, of which 13 are from Moody's, 17 from S&P and 12 from Fitch. After modelling 22 downgrades and 20 upgrades it is clear that yields respond differently among each agency. We find evidence of significant positive AR at the 10% level for Moody's downgrades in the narrow event window. Whilst no significant AR are observed from S&P and Fitch downgrades. Moody's and S&P downgrade CAR are positively significant at the 5% and 10% level respectively.

Table 4, panel C provide that bond yields react uniquely to Fitch rating changes. Fitch is the only agency of the three that has significant evidence for upgrades. AR in the narrow window and both CAR values for Fitch upgrades are negatively significant at the 10% and 5% levels.

Table 4: ***Bond Market Agency Analysis***

Panel A: 10Y Bond Yields using Moody's Rating Changes						
Rating	Events	Window	AR	t-stat	CAR	t-stat
Downgrade	8	(-5:5)	-0.0001	-0.0227	-0.0012	-0.2497
		(-1:1)	0.0023	2.3355*	0.0070	2.7285**
Upgrade	5	(-5:5)	-0.0005	-0.0463	-0.0056	-0.5747
		(-1:1)	0.0005	0.0488	0.0016	0.1463
Total	13					
Panel B: 10Y Bond Yields using S&P Rating Changes						
Rating	Events	Window	AR	t-stat	CAR	t-stat
Downgrade	8	(-5:5)	0.0003	0.0623	0.0029	0.7079
		(-1:1)	0.0007	0.3625	0.0021	1.7500*
Upgrade	9	(-5:5)	-0.0003	-0.1108	-0.0028	-1.2577
		(-1:1)	-0.0005	-0.1347	-0.0016	-0.4042
Total	17					
Panel C: 10Y Bond Yields using Fitch Rating Changes						
Rating	Events	Window	AR	t-stat	CAR	t-stat
Downgrade	6	(-5:5)	0.0004	0.0731	0.0042	0.6516
		(-1:1)	0.0004	0.1176	0.0013	0.3528
Upgrade	6	(-5:5)	-0.0024	-0.4553	-0.0264	-2.3407**
		(-1:1)	-0.0046	-1.9316*	-0.0137	-4.0437**
Total	12					

Note: Probability t-distribution *,**,*** denote statistical significance at 10% ,5% and 1% levels, respectively.

Source: Author

Emerging Market 10Y Bond Yield Abnormal Returns from Moody's, S&P & Fitch Ratings

Figure 4

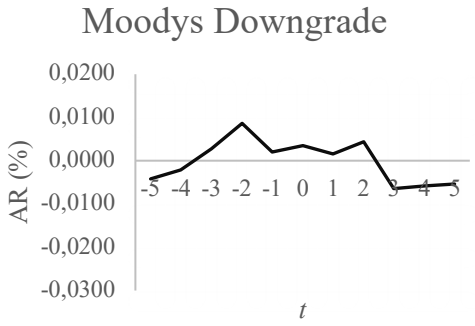


Figure 5

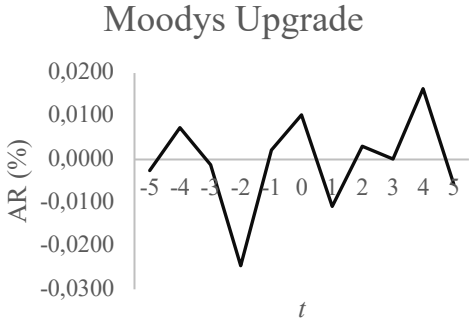


Figure 6

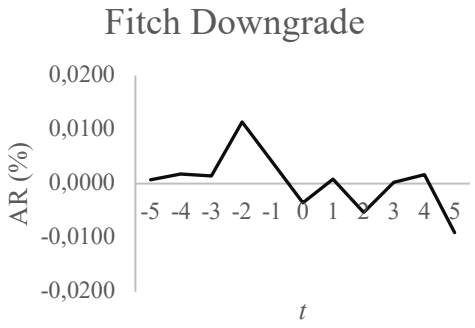


Figure 7

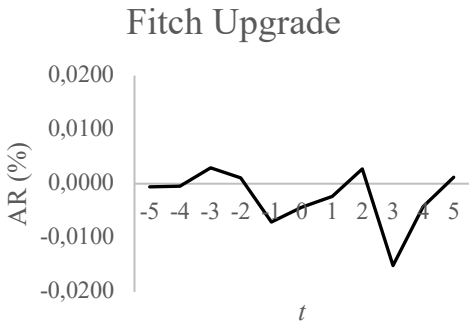


Figure 8

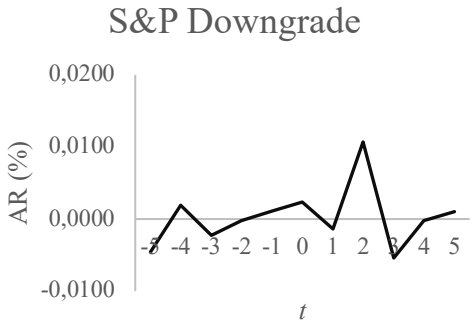
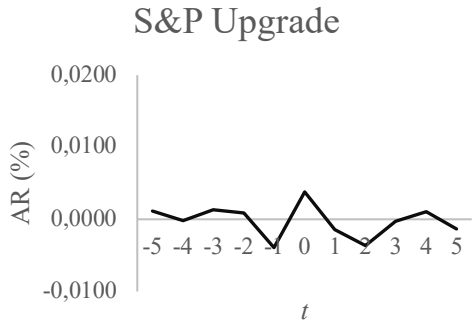


Figure 9



Source: Author

Visual inspection of Figures 4 to 9 show that AR trends are similar for Moody's and S&P rating changes. For S&P and Moody's downgrades AR rise a days prior *t*-0 and fall a day later. To the same extent, S&P and Moody's AR fall sharply immediately following upgrades. In comparison Figures 6 and 7 AR from Fitch ratings follow a different timing. AR rise momentarily at *t*-3 only and again at *t*-0 for Fitch downgrades and decline at a delayed *t*+2 for Fitch upgrades. One plausible explanation may be that Fitch employs a slightly different strategy to the other agencies when signalling possible rating changes. According to Alsakka and Gwilym (2012), Fitch is the most dependent and should mostly link with the other agencies actions, however their analysis looks at outlook and review announcements.

4.2.2. Impact of Rating Signal Announcements

Table 5 presents the results from event studies using rating outlook and watchlist announcements. Note only outlook and watchlist announcements where the actual rating remained unchanged are analysed to isolate the impact. Rating agencies express that an outlook change or placement on a watchlist does not prescribe an inevitable rating action. Due to the

prognostic nature of these announcements, this research deliberately refrained from an agency-specific analysis in this regard. From the three rating agencies, 62 events are examined, that is 26 negative outlooks, 18 stable outlooks, 15 positive outlooks and 3 negative placements on a watchlist. This is not an exhaustive list of the types of announcements available, but rather an outcome of the data collection criteria.

The results of this analysis suggest an asymmetrical bond yield impact. Similar to the outcomes of Table 3, in Table 5 we find no evidence of statistical significance for AR values regardless of window length. CAR significance results indicate that the informational value of the announcement diminishes the more positive it is. For the reason that we find evidence of significant CAR in both windows for all the announcements except positive outlooks. The 11 and 3 day CAR for stable outlooks are negatively significant at the 5% level. The 11 day CAR for negative outlooks and watchlists are strongly positively significant at the 1% level. Puzzling 3 day CAR from negative outlooks is significant but at 10% and in the opposite direction to the 11 day CAR. Graphical interpretation of Figure 10 may assist in understanding this outcome.

Table 5: ***Bond Market Rating Signal Analysis***

Panel A: 10Y Bond Yields using Rating Signals						
Outlook	Events	Window	AR	t-stat	CAR	t-stat
Negative	26	(-5:5)	0.008	0.2871	0.008	3.1580***
		(-1:1)	-0.0012	-0.6994	-0.0037	-2.0983*
Negative Watchlist	3	(-5:5)	0.0046	0.4908	0.0509	5.3991***
		(-1:1)	0.0087	0.9246	0.0262	2.7737**
Stable	18	(-5:5)	-0.0011	-0.5824	-0.0123	-2.7306**
		(-1:1)	-0.0014	-0.6424	-0.0043	-1.9271*
Positive	15	(-5:5)	0.0001	0.0294	0.0013	0.3428
		(-1:1)	-0.0018	-0.4024	-0.0055	-1.2713
Total	62					

Note: Probability t-distribution *,**,*** denote statistical significance at 10% ,5% and 1% levels, respectively.

Source: Author

Figures 10-13 illustrate the impact of each type of announcement during the event window. Focus is placed on days subsequent announcement *t*-0, because signals are intended as expressions of future change. AR prior announcement while key may not translate as anticipatory effects. Bearing in mind modelled rating upgrades and downgrades Figures 10 and 12 fit our expectations. Being yields increase post *t*-0 for negative outlooks, and fall following a stable outlooks. Upon closer scrutiny of Figure 11, we find evidence of positive significance

of AR for negative watchlist on *t*-0 and *t*+1 at the 1% and 5% level respectively. Remarkably we also find AR on *t*-2 and *t*-1 to be negatively significant at the 5% and 10% level. Considering the low number of events, contamination may be responsible for the shape of Figure 11. Figure 13 is of no real concern due to lack of significance of positive outlook results.

10Y Bond Yield Abnormal Returns from Rating Signals

Figure 10

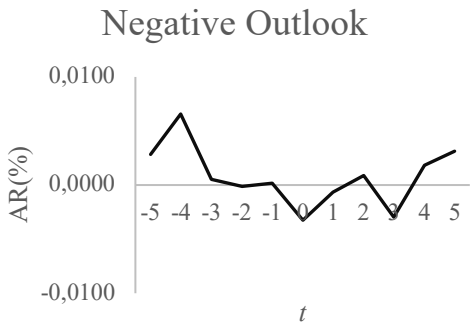


Figure 11

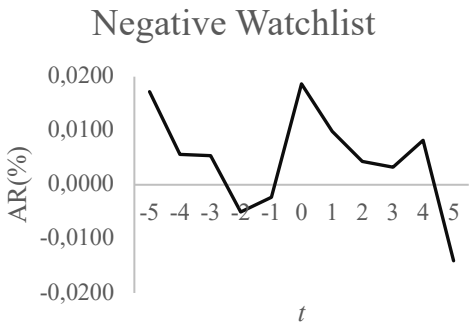


Figure 12

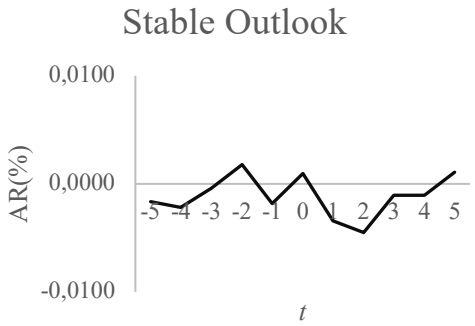
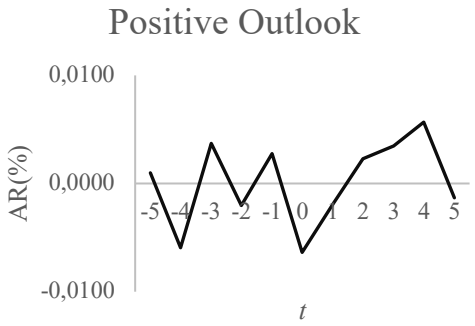


Figure 13



Source: Author

4.2.3. Impact of Investment Grade Rating

Table 6 presents the results of the event studies using rating changes that result in either a loss/downgrade or gain/upgrade in investment grade status. The null hypothesis is that the abnormal returns are equal to zero irrespective of investment grade rating. Using all three major rating agencies, a total of 10 events are analysed, 4 downgrades and 6 upgrades. Similar to the overall results in Table 3 AR for investment grade downgrades and upgrades are non-significant. Albeit AR from rating changes that cross the investment grade threshold are larger than all other rating changes shown in Table 3.

Table 6, panel A, shows that the 3 day CAR for downgrades is positively significant at the 5% level. The 11 and 3 day CAR investment grade upgrades are negatively significant at the 5% and 10% level respectively. This suggests that a loss of investment grade rating increases bond yields. Conversely gaining an investment grade rating decreases bond yields. The degree of the impact is greater when investment grade rating is lost or downgraded. AR plotted in Figures 14 and 15 confirm this effect, however only when assessing the narrow event window. Taking into account the wide window unusual effects emerge. Upon investigation of each event day we find significant evidence of negative AR for downgrades on *t*+3 and *t*+4 which provides some insight into the shape of Figure 14. However no rationale as to why this may have occurred other than the issue of low number of events, not representing the full population.

Table 6: ***Bond Market Investment Grade Rating Analysis***

Panel A: 10Y Bond Yields using Investment Grade Ratings						
	Events	Window	AR	t-stat	CAR	t-stat
Downgrade	4	(-5:5)	-0.0004	-0.0552	-0.0042	-0.5983
		(-1:1)	0.0031	1.4652	0.0093	4.3956**
Upgrade	6	(-5:5)	-0.0034	-0.7226	-0.0369	-3.0406**
		(-1:1)	-0.0037	-0.4459	-0.0111	-1.5384*
Total	10					

Note: Probability t-distribution *,**,*** denote statistical significance at 10% ,5% and 1% levels, respectively.

Source: Author

10Y Bond Yield Investment Grade Abnormal Returns from Moody's, S&P and Fitch

Figure 14

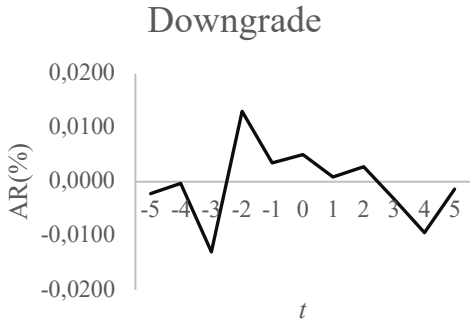
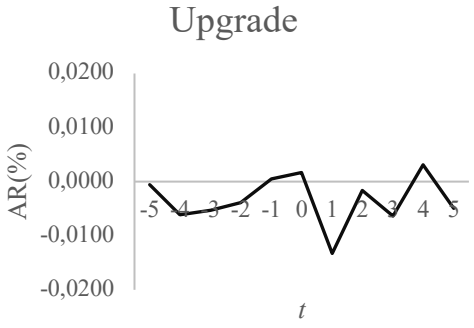


Figure 15



Source: Author

In similar format to Table 4, Table 7 below presents the investment grade analysis for each rating agency. Each agency tends to follow the leader in terms of assigning and removing investment grade ratings. S&P and Moody's switch turns as leader while Fitch regularly trails behind. A total of 10 events are analysed, all are of one notch rating changes. In general ratings

changes of more than one notch are in-frequent. Rating agencies tend to rather make multiple announcements of marginal rating changes in quick succession to another if necessary.

Table 7: ***Bond Market Investment Grade Rating Agency Analysis***

Panel A: 10Y Bond Yields using Moody's Investment Grade Ratings						
Rating	Events	Window	AR	t-stat	CAR	t-stat
Downgrade	2	(-5:5)	-0.0012	-0.2089	-0.0129	-2.1017*
		(-1:1)	0.0053	1.5264	0.0111	2.6928**
Upgrade	2	(-5:5)	-0.0080	-0.9935	-0.0876	-3.0960**
		(-1:1)	-0.0085	-0.7711	-0.0138	-1.2417
Total	4					
Panel B: 10Y Bond Yields using S&P Investment Grade Ratings						
Rating	Events	Window	AR	t-stat	CAR	t-stat
Downgrade	1	(-5:5)	0.0032	0.1953	0.0351	1.8649*
		(-1:1)	0.0017	0.1471	0.0052	0.7229
Upgrade	3	(-5:5)	-0.0014	-0.2522	-0.0149	-2.7738**
		(-1:1)	0.0009	0.1272	0.0028	0.3815
Total	4					
Panel C: 10Y Bond Yields using Fitch Investment Grade Ratings						
Rating	Events	Window	AR	t-stat	CAR	t-stat
Downgrade	1	(-5:5)	-0.0003	-0.0491	-0.0029	-0.5406
		(-1:1)	0.0036	0.7057	0.0108	2.1172*
Upgrade	1	(-5:5)	-0.0045	-0.4427	-0.0493	-2.2457**
		(-1:1)	-0.0109	-0.8820	-0.0326	-2.6461**
Total	2					

Note: Probability t-distribution *,**,*** denote statistical significance at 10% ,5% and 1% levels, respectively.

Source: Author

Once more we find no evidence of significance from the AR values. From the CAR values we find significance from both rating changes for all three agencies. Surprisingly Moody's downgrade has evidence of both positive and negative CAR, which warrants further scrutiny. We place confidence in the results of the narrow event window. Days *t*+3 and *t*+4 of the wide window are negatively significant following Moody's investment grade downgrade at the 1% and 10% level. Which reiterates the risk of contaminating abnormal returns with other news when using longer event windows. AR from Fitch downgrades are positively significant at *t*-1 at the 10% level. However for S&P downgrades we find 5% significance of AR outside the narrow window at *t*-2.

Weaker significance is found following upgrades all at the 10% level. Moody's upgrade AR are negatively significant at *t*-2 and *t*-3, whilst S&P and Fitch upgrade AR significance occur after announcement on *t*+3 and *t*+1 respectively.

Emerging Market 10Y Bond Yield Abnormal Returns from Investment Grade

Figure 16

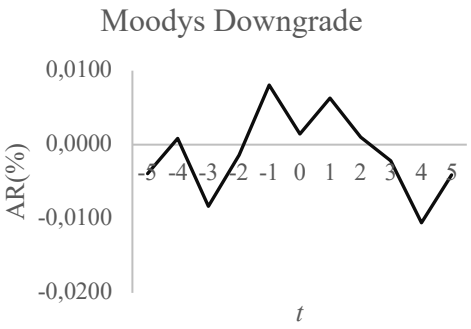


Figure 17

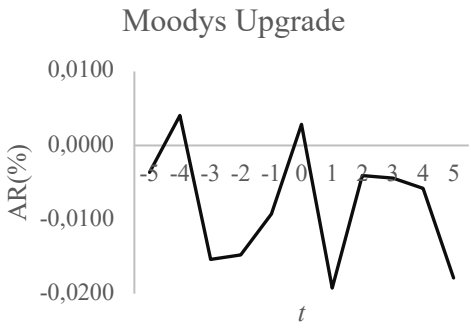


Figure 18

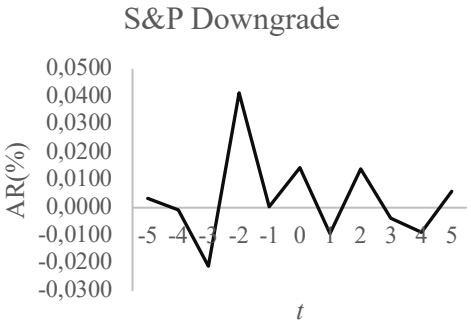


Figure 19

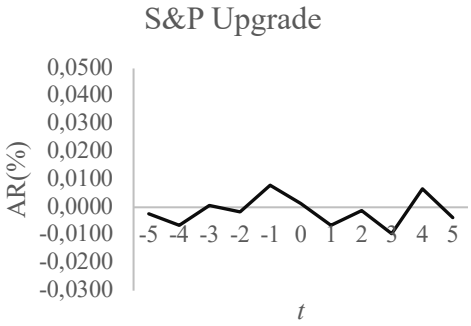


Figure 20

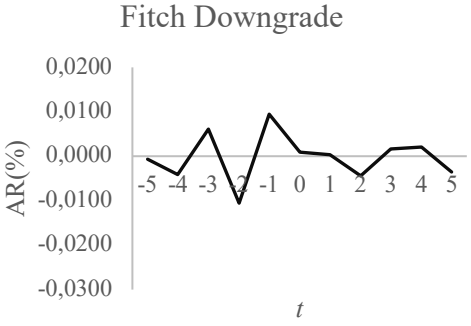
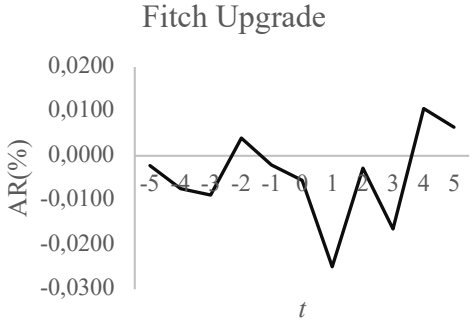


Figure 21



Source: Author

4.3. EMERGING STOCK MARKET RETURNS

4.3.1. Impact of Rating Changes

Table 8, presents results for the total sample of actual ratings changes. The null hypothesis is that the abnormal returns are equal to zero, because rating changes do not hold any additional informational value. A total of 177 actual rating changes were modelled, out of which 80 are downgrades and 97 are upgrades. There is no statistically significant evidence of stock market AR for both event window lengths. CAR associated with actual rating upgrades are positive and statistically significant at the 5% level for both event windows. Contrary to stock market theory the 11-day CAR for downgrades is positive and strongly statistically significant. To explain why this has occurred would require assessing each event day. Figure 22 and 23 present an illustration of stock market AR throughout the event window. Looking at the curves below, AR on day *t*-0 indicates that stock market returns respond negatively to rating downgrades and positively to rating upgrades. AR *t*-2 for rating downgrades is negatively significant at the 10% level, suggesting possible market anticipation. Interestingly post *t*-0 AR trends steeply in the opposite direction which could be a market correction from overreaction. Nonetheless, caution must be taken when interpreting the signs of AR and CAR mean values of different event window lengths.

Table 8: ***Stock Market Abnormal Returns Analysis***

Panel A: Stock Market Returns using Rating Changes						
	Events	Window	AR	t-stat	CAR	t-stat
Downgrade	80	(-5:5)	0.0007	0.3203	0.0077	3.5231***
		(-1:1)	0.0008	0.4841	0.0024	1.4522
Upgrade	97	(-5:5)	0.0005	0.3916	0.0057	2.6381**
		(-1:1)	0.0015	1.5116*	0.0046	4.5349**
Total	177					

Note: Probability t-distribution *,**,*** denote statistical significance at 10% ,5% and 1% levels, respectively.

Source: Author

Stock Market Abnormal Returns

Figure 22

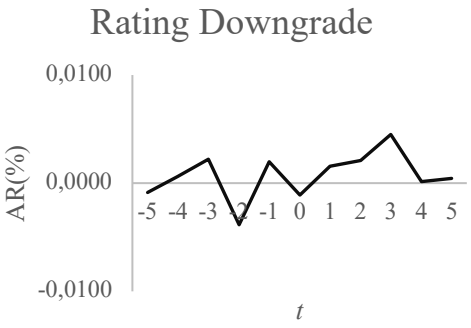
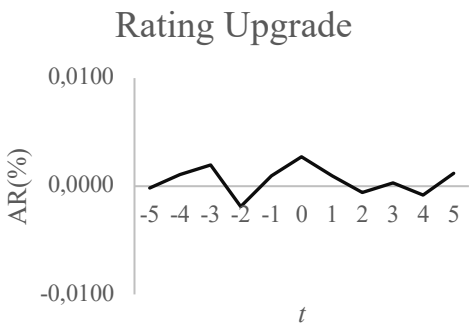


Figure 23



Source: Author

Table 9 below presents the mean results of the event studies using rating changes from Moody's, S&P and Fitch respectively. The null hypothesis is that abnormal returns are equal to zero for all three agencies. The analysis consists of a total of 161 events. Table 9, panel B and C draw some similarities between S&P and Fitch. The 11-day CAR from rating downgrades are positively statistically significant at the 5% level for S&P and Fitch. In addition rating upgrades 11-day and 3-day CAR exhibit some statistical significance except for Moody's. Little insight can be drawn from AR in Table 9 without evidence of significance. Similarly Figures 23 to 26 are inconclusive. Positive CAR values following downgrades are an extension of results outlined in Table 8. Considering the significance and magnitude of AR and CAR, S&P is the leading firm for emerging stock markets.

Table 9: ***Stock Market Abnormal Returns Agency Analysis.***

Panel A: Stock Market Returns using Moody's Rating Changes						
	Events	Window	AR	t-stat	CAR	t-stat
Downgrade	22	(-5:5)	-0.0001	-0.0388	-0.0012	-0.4268
		(-1:1)	0.0005	0.3509	0.0016	1.053
Upgrade	33	(-5:5)	0.0003	0.1124	0.0029	1.2363
		(-1:1)	-0.0003	-0.1043	-0.0010	-0.3130
Total	55					
Panel B: Stock Market Returns using S&P Rating Changes						
	Events	Window	AR	t-stat	CAR	t-stat
Downgrade	23	(-5:5)	0.0008	0.2770	0.0087	3.0472**
		(-1:1)	0.0001	0.0474	0.0004	0.1423
Upgrade	37	(-5:5)	0.0020	0.7828	0.0225	2.5472**
		(-1:1)	0.0040	1.4462	0.0121	2.1585*
Total	60					
Panel C: Stock Market Returns using Fitch Rating Changes						
	Events	Window	AR	t-stat	CAR	t-stat
Downgrade	18	(-5:5)	0.0022	0.4011	0.0243	2.5463**
		(-1:1)	0.0008	0.1987	0.0023	1.2736
Upgrade	28	(-5:5)	0.0007	0.2529	0.0074	1.7113*
		(-1:1)	0.0030	0.9630	0.0089	2.8889**
Total	46					

Note: Probability t-distribution *,**,*** denote statistical significance at 10% ,5% and 1% levels, respectively.

Source:Author

Stock Market Abnormal Returns from Moody's, S&P & Fitch Ratings

Figure 24

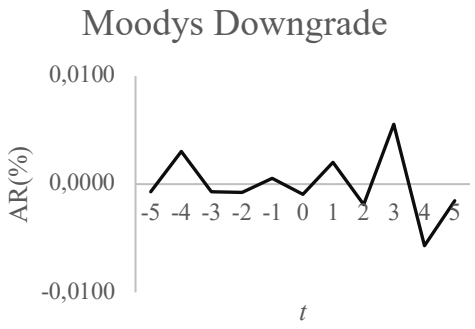


Figure 25

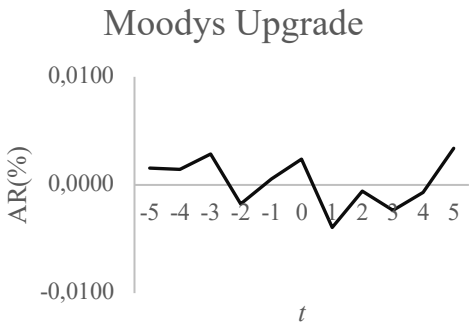


Figure 26

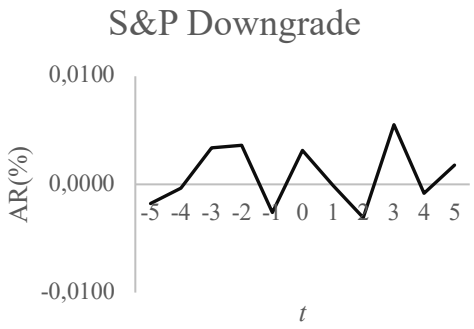


Figure 27

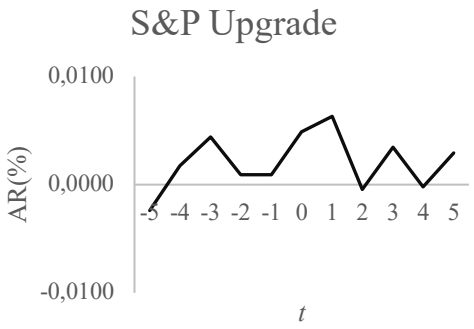


Figure 28

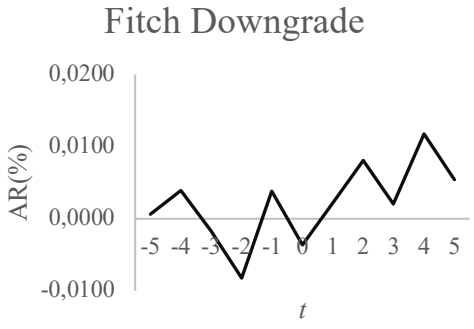
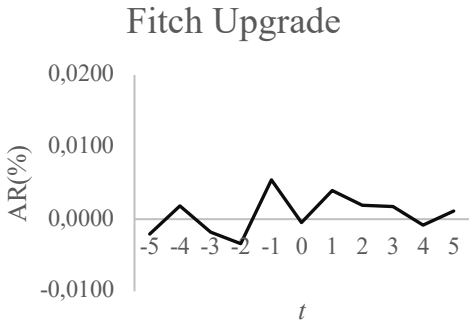


Figure 29



Source: Author

4.3.2. Impact of Rating Signal Announcements

Table 10, presents the results from event studies using rating signal announcements, more specifically outlook changes and watchlists. Considering the 11 and 3 day CAR, stock market returns respond significantly negative to negative outlooks at the 5% and 10% levels. CAR is more muted following negative watchlist events with positive significance at 10%. There is no surprise that stable announcements appear to have the least impact by magnitude and significance. Whilst positive outlook have mixed results, with negative and positive significance for the 11 day and 3 day CAR at 5% and 10%. It is difficult to interpret Table 10 results as we find conflicting evidence for negative outlooks and negative watchlists showing negative and positive signs respectively. The two mentioned announcements are meant to communicate a similar message however the market reaction appears to differ.

Table 10: ***Stock Market Rating Signal Analysis***

Panel A: Stock Market Returns using Rating Signals						
Outlook	Events	Window	AR	t-stat	CAR	t-stat
Negative	48	(-5:5)	-0.0004	-0.2014	-0.0042	-2.2151**
		(-1:1)	-0.0010	-0.6492	-0.0030	-1.9476*
Negative Watchlist	13	(-5:5)	0.0016	0.1515	0.0174	1.6664
		(-1:1)	0.0092	0.5703	0.0275	1.7108*
Stable	57	(-5:5)	0.0000	0.0255	0.0005	0.2801
		(-1:1)	-0.0003	-0.2543	-0.0009	-0.7629
Positive	60	(-5:5)	-0.0012	-0.5366	-0.0129	-3.0096**
		(-1:1)	0.0007	1.0884	0.0022	1.9610*
Total	178					

Note: Probability t-distribution *,**,*** denote statistical significance at 10% ,5% and 1% levels, respectively.

Source:Author

Figures 30-32 below reveal that the relationships between each announcement type and abnormal stock market returns. Figures 30 and 31 show that prices are plummeting following a negative announcement with the impact more pronounced for watchlist events. Figure 32 shows little market reaction following stable announcements. Figure 33 takes a strange shape with AR rising closer to *t*-0 and declining days after. AR *t*+3 for positive outlooks is negatively significant at the 5% level. There's no immediate explanation as to why this has occurred.

Stock Market Abnormal Returns from Rating Signals

Figure 30

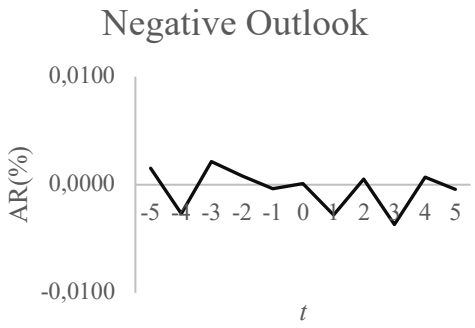


Figure 31

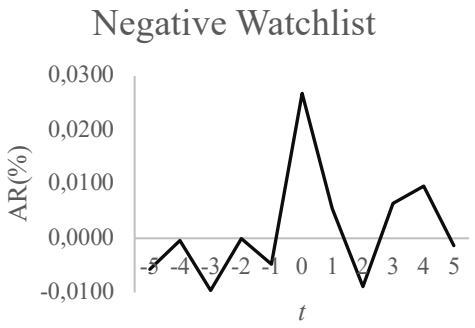


Figure 32

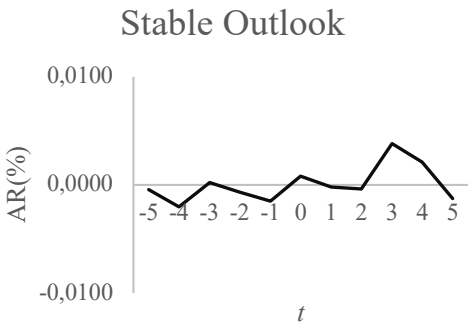
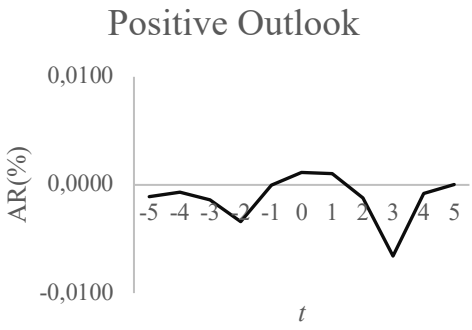


Figure 33



Source: Author

4.3.3. Impact of Investment Grade Rating

Table 11 presents the mean results of the event studies using rating changes that result in either a loss(downgrade) or gain(upgrade) in investment grade status. Using all three major credit rating agencies, a total of 25 events are analysed, 11 downgrades and 14 upgrades. Table 10, panel B demonstrates that AR are non-significant irrespective of rating change direction and event window length. The 11 day CAR for investment grade downgrade is positively significant at the 10% level. Visual inspection of Figures 19 and 20 reveal asymmetry in the magnitude of Abnormal Returns. The return impact of losing an investment grade rating is comparably higher than when it is gained. Also, we find AR *t*+2 for downgrades is negatively significant, whilst AR *t*-0 for rating upgrades is positively significant both at the 10% level.

Table 11 : ***Stock Market Investment Grade Rating Analysis***

Panel B: Stock Market Abnormal Returns using Investment Grade Ratings						
	Events	Window	AR	t-stat	CAR	t-stat
Downgrade	11	(-5:5)	0.0007	0.2306	0.0080	2.5370**
		(-1:-1)	-0.0010	-0.2833	-0.0030	-0.8500
Upgrade	14	(-5:5)	0.0002	0.0817	0.0020	0.8988
		(-1:1)	0.0006	0.1418	0.0018	0.4255
Total	25					

Note: Probability t-distribution *,**,*** denote statistical significance at 10% ,5% and 1% levels, respectively.

Source: Author

Stock Market Abnormal Returns from Investment Grade Ratings

Figure 34

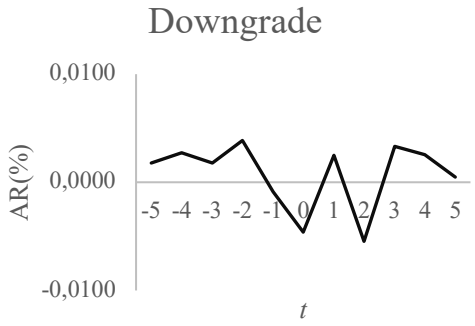
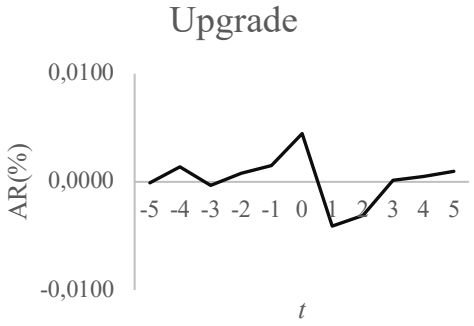


Figure 35



Source:Author

Table 12 below echoes that stock market returns are negatively impacted by a loss of investment grade rating, while the evidence for upgrades is less convincing. The 11-day Moody's CAR and 3 day S&P CAR following downgrades are negative and statistically significant at the 5% and 10% level respectively. S&P is the only firm with evidence for investment grade upgrade with 3 day CAR positively significant at 10%. There is no significant evidence for Fitch investment grade rating changes. Visual inspection of Figures 36-41 shows that the magnitude and volatility are higher for downgrades, while muted for upgrades. Stock markets also appear to exhibit anticipation, Moody's and S&P abnormal returns begin to decline after *t*-2. Correspondingly abnormal returns rise *t*-3 days prior to S&P upgrade announcements.

Table 12: ***Stock Market Investment Grade Rating Agency Analysis***

Panel A: Stock Market Returns using Moody's Ratings						
Rating	Events	Window	AR	t-stat	CAR	t-stat
Downgrade	4	(-5:5)	-0.0022	-0.2575	-0.0243	-2.1813**
		(-1:1)	-0.0047	-0.6877	-0.0051	-0.7477
Upgrade	6	(-5:5)	0.0003	0.0882	0.0032	1.0367
		(-1:1)	0.0002	0.0387	0.0047	0.7345
Total	10					
Panel B: Stock Market Returns using Standard and Poor's Ratings						
Rating	Events	Window	AR	t-stat	CAR	t-stat
Downgrade	2	(-5:5)	0.0017	0.1471	0.0192	1.4408
		(-1:1)	-0.0045	-0.4616	-0.0135	-1.7071*
Upgrade	5	(-5:5)	-0.0002	-0.0437	-0.0023	-0.4138
		(-1:1)	0.0054	0.9147	0.0162	1.9447*
Total	7					
Panel D: Stock Market Returns using Fitch Ratings						
Rating	Events	Window	AR	t-stat	CAR	t-stat
Downgrade	2	(-5:5)	-0.0013	-0.1069	-0.0144	-0.9270
		(-1:1)	-0.0008	-0.0566	-0.0023	-0.1699
Upgrade	3	(-5:5)	0.0007	0.1482	0.0078	1.4403
		(-1:1)	0.0024	0.3021	0.0073	0.9062
Total	5					

Note: Probability t-distribution *,**,*** denote statistical significance at 10% ,5% and 1% levels, respectively.

Source:Author

Stock Market Abnormal Returns from Investment Grade Rating Changes

Figure 36

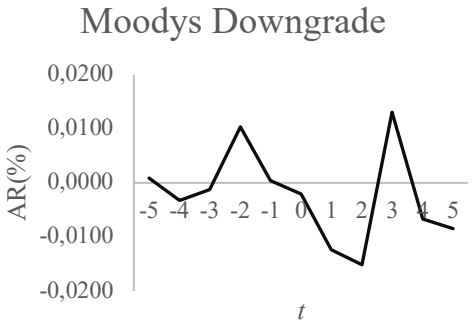


Figure 37

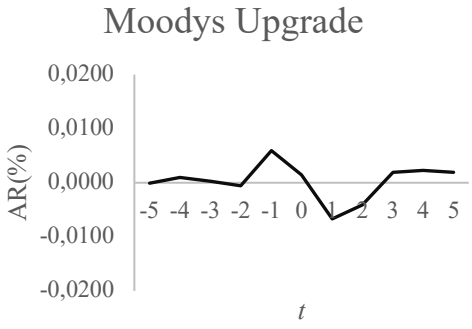


Figure 38

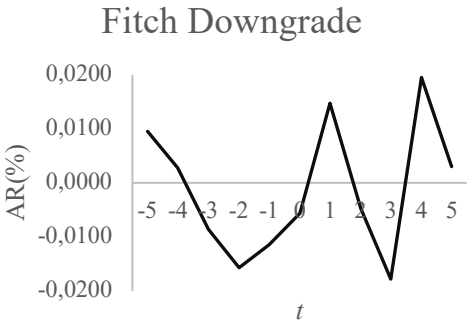


Figure 39

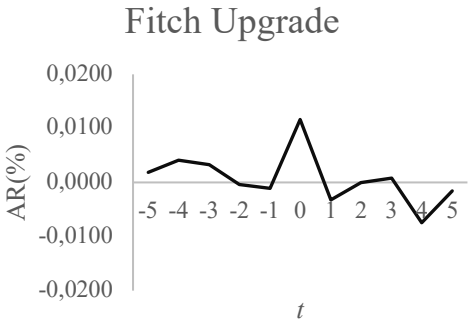


Figure 40

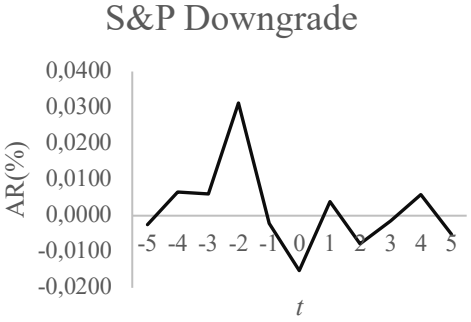
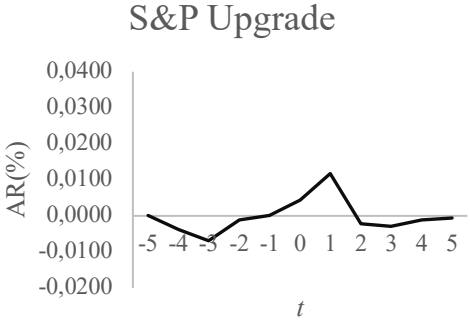


Figure 41



Source:Author

4.4. SUMMARY

Whilst the existing literature presents inconclusive evidence, we have obtained some interesting findings to compare with previous studies. This section only discusses comparisons with literature based on emerging markets. Overall, we find evidence of significance for both positive and negative rating events in both the bond and stock markets.

Sovereign credit ratings downgrades have a significant positive impact on bond yields, whilst rating upgrades are non-significant. This asymmetrical result is a consistent theme in the literature (Bissoondoyal-Bheenick, 2012). Reisen Maltzen (1998) label this outcome as a product of investor herd behaviour and regulation as opposed to informational content of ratings. Emphasizing that rating changes occur too late and reduce the benefits of emerging markets by destabilizing international capital flows.

This research approach differs from Binici *et al*. (2018) which uses a two-day event window. However, our CAR results are similar. From the results, it is evident that downgrades have informational value on bond yields, and it appears that downgrades are anticipated. As with Steiner and Heinke (2001), there is an element of overreaction prior rating announcement followed by a correction. This is contrary to the expectation as the information once discounted should have a sustained impact on the level of risk associated with a security. In agreement with Binici *et al.* (2018) upon closer investigation the market impact for both upgrades and downgrades in certain circumstances depending on the preceding outlook. Chapter 4 results differ completely from Ismailescu and Kazemi (2010) who find an impact from positive rating announcements only, which may be because their analysis looks at CDS spreads and not yields. Ismailescu and Kazemi (2010) point towards strong anticipation of negative events, or that positive events are more likely to spillover countries to rationalize this finding. This study agrees in principle that rating events may be anticipated, hence our investigation into signal announcements which is discussed later.

Rating upgrades while not significant on bond yields are positively significant on stock market abnormal returns. The magnitude of abnormal returns is economically small for both rating changes, however downgrades do have a larger impact in comparison. Our results differ with Freitas and Minardi (2012) whose CAR for upgrades were generally non-significant. Freitas and Minardi's (2012) event study focuses only on four Latin American stock markets, which are included in our sample, however the event windows are much larger than our analysis. In addition, they use a market adjusted return model but find CAR values show market anticipation for downgrades with sustained impacts post announcements. Our findings support Mateev (2012) as stock market abnormal returns start emerging two days prior to announcement and are sustained throughout the event window.

The literature review in Chapter 2 has also suggested that the impact on abnormal returns is at times dependent on the rating agency. When looking at the bond yield results at an agency level, we find significant abnormal returns following upgrade announcements by Fitch only. This is contrary with Bissoondoyal-Bheenick (2012) who find that only S&P rating upgrades don't have an impact on the market. Our results find similar non significance from S&P upgrades unless the rating change determines the investment grade status of the bond. We also fail to find significant abnormal returns following Moody's upgrades.

In line with Mollemans (2004) our results show Moody's ratings to have the least influence on stock market returns both by magnitude and significance of abnormal returns. Martell (2005) establish that S&P rating changes are more informative than Moody's rating changes. Martell (2005) and this study have similar country samples and event window lengths but differ on periods observed, Martell (2005) CAR shows that emerging stock market investors only respond to S&P rating changes. Our results contend and find strong reaction Fitch to rating changes. Chapter 4 confirms Hill and Faff (2010) findings and conclude that S&P rating changes are the most influential on emerging stock markets. Safari and Ariff (2015) argue that stock markets only react to downgrades. To the contrary this research disagrees and finds there is sufficient evidence that suggest emerging stock markets positively respond to rating upgrades.

Stable outlook announcements unsurprisingly have little market impact on bond and stock markets, with no significance on stock markets. The evidence of significance for stable outlooks on bond yields is significant yet the magnitude of impact is the small. Negative rating signal announcements are strongly significant on emerging bond yields in agreement with Kiff *et al.* (2012). Positive outlooks are non-significant in line with IMF (2012) and Paterson and Gauthier (2013) who argue that these events are quantitatively non-informative. The bond yields findings agree with IMF (2010) and Alsakka and Gwilym (2013), signal announcements such as outlooks and watchlist events have higher informational value in comparison to rating changes. Contrary to Alsakka and Gwilym (2013), Pukthuanthong-Le *et al.* (2007) using a 3-day event window find a significant positive impact from outlook upgrades and mention that outlooks are at least as important as rating changes for bond markets.
As set out in Chapter 4 under the stock analysis, outlook and actual ratings for emerging stock markets are equally as important. Whereas Freitas and Minardi (2013) for watch events find no visible patterns, this research finds conflicting significance for negative and positive outlooks with the exception of stable outlooks. Unexpectedly negative cumulative abnormal returns following positive outlooks and positive cumulative abnormal returns following negative watchlist announcements were presented in Chapter 4.

Investment grade rating matters more for the bond markets than it does for the stock markets. This can be said for all three major rating agencies. For stock abnormal returns Fitch investment grade ratings have no effect. Moody's exhibits significance only for investment rating downgrades, whereas both S&P ratings are significant. Overall convincing negative stock

returns evidence is found for investment grade downgrades. Upgrading into investment grade has a positive impact on stock returns however the results are insignificant.

In comparison bond yields respond significantly to both investment grade upgrades and downgrades in the expected direction. Similar CAR results can be found in Jaramillo and Tejada (2011) paper. The influential strength investment grade ratings present for bond markets is expected as this evidently relates to regulatory compliance. At an agency investment grade rating downgrades announced Moody's shows mixed results. This is probably an issue associated with the small number of observations. Nonetheless the current study confirms that investment grade does matter for emerging bond markets.

CHAPTER 5: CONCLUSION

This research sought out to investigate the impact sovereign credit rating announcements have on bond and stock market returns in emerging markets. To achieve this several event studies were carried out to model abnormal returns surrounding an announcement. Literature regarding the history, role and influence of CRAs and sovereign credit ratings was reviewed. A unique approach was taken with the guidance of a number of insightful studies. Event study results were interpreted by means of comparison to previous findings. Sovereign credit ratings were found to hold informational value on emerging financial markets post the global financial crisis.

5.1. SUMMARY

Three major CRAs account for more than 90% of the global rating industry. Moody's is the oldest of the three agencies established in the 1900s. S&P through a merger was formed in 1941. Fitch began issuing its first rating assessments in 1924 (Cantor and Packer, 1995). CRAs assess the creditworthiness of corporate and sovereign government debt issuers and assign a rating. The purpose of this exercise is intended to reduce asymmetric information in a lending relationship (Ligeti and Szorfi, 2006). Larger financial institutions often use internal credit risk assessments in conjunction with the ratings provided by CRAs. Smaller financial institutions and retail investors are more likely to depend on CRAs in their investment decision-making process. Considering the wide scope of end-users and beneficiaries of rating assessments, CRAs play a central role in the allocation and direction of capital flows.

A role which as of late has come into question. Critics have doubted the informational value and effectiveness of credit ratings issued by the three major agencies. Ozturk *et al.* (2016) even go as far as encouraging firms with internal credit scoring systems to rely less on ratings issued by these agencies. The common premise for this criticism stems from the multiple financial crisis's that have occurred in the presence of relatively high credit ratings. In addition, the three major agencies are accused of providing rating changes too late and lagging behind economic indicators. Consequently, exacerbating boom-bust cycles and unduly increasing market volatility. Despite extensive criticism, CRAs have become instrumental in the performance of emerging markets.

Before 1990 rating agencies largely focused on industrialized regions (Bhatia 2002, Kraussl, 2003). Since then according to Mellios and Paget Blanc (2006) the number of emerging market sovereign credit ratings has expanded considerably. Globalization and the increasing demand for international diversification have placed emerging markets at the center stage for investors. However, investor demand is discouraged by challenges associated with information pertaining to these markets. Which is often is less readily available, incomplete and at times unreliable. As a result, investors have a strong preference for rated securities versus non-rated securities (Erdem and Varli, 2014).

However even emerging market entities with rated securities have their own troubles. Gültekin-Karakaş *et al.* (2011) claim that the three major CRAs rating behaviour is biased in favour of developed countries regardless of their macroeconomic fundamentals. Yalta and Yalta (2018) support Gültekin-Karakaş *et al.* (2011) notion and affirm that emerging markets receive stricter credit evaluation treatment in comparison to more developed nations. Public and private sectors of emerging markets are mindful of the implications ratings may have their borrowing costs and ability to raise capital. To this effect the research findings are of value to market participants including retail and institutional investors, rating agencies, policy makers and governments.

Bhatia (2002) defines sovereign credit ratings as an indication of the capacity and willingness of rated governments to repay its financial obligations in full and on time. It follows that a high rating is associated with a low probability of default and vice versa. Two types of ratings are assigned namely in foreign and local currency. Ratings can be divided according to investment and non-investment grade. In addition to ratings CRAs also announce watchlists, reviews and outlooks which provide an indication on future ratings (Bannier and Hirsch, 2010).
Criteria and assessment frameworks employed by CRAs as well as main determinants of sovereign credit ratings, are outlined in Chapter 2. Chapter 2 also details the findings from previous studies which observe the impact of sovereign credit ratings on the bond and stock markets.

The criteria and assessment framework employed by the three major CRAs is largely similar. Both qualitative and quantitative data is considered. Kraussl (2003) points out two important characteristics in how this data is assessed. The first being economic risk and the second is

political willingness. The latter is particularly important for sovereign credit ratings. Unlike for corporate debt issuers enforcing repayment from a sovereign government is complex.
Most if not all the data variables employed in calculating ratings are made publicly available. Depending on the strength of the efficient market hypothesis, bond and stock prices should already incorporate all available information. Nevertheless, interpreting data without sufficient expertise may be costly and difficult. CRAs add value by processing and packaging noisy data into a comprehendible message of a rating. Economies of scale allow for these services to be offered at competitive rates.
If ratings are informative the expectation is that positive rating events will have a positive impact on bond and stock market returns. Following negative rating events, the expectation is a negative impact on bond and stock returns. Conversely if ratings are merely summaries and do not contain any new tradable information, we expect no significant impact on market returns.

Existing literature concerning the impact of sovereign credit ratings on the bond and stock market is inconclusive. A wholistic view of the current evidence reveals that the impact of ratings observed is dependent on the following aspects:

- If a rating event was unanticipated and caught market participants by surprise it promps a sudden market reaction; expectations are shaped by review, outlook and watchlist announcements.
- Negative events have a recognizably larger impact in comparison to positive events. This disproportionate market reaction suggests a strong tendency of loss aversion exists. Market participants may be more fearful of losses than they are optimistic of possible gains.
- If the rating event determines the sovereign's investment grade status, it is likely to be followed by notable market movements.
- The impact of sovereign credit rating events on bond and stock market returns varies in relation to the specific agency making the announcement.

Therefore, depending on how the research methodology is framed, results may contrast.

To capture the impact of sovereign credit rating announcements on stock and bond markets, we observe abnormal returns of bond and stock markets surrounding announcement dates.
Chapter 3 outlines the data collected, event methodology steps taken, and the testing framework employed. The sample consists of sovereign credit rating history, bond yields of

ten-year maturity and stock market return data. Twenty-four emerging markets were included in the sample, compiled directly from the list of countries itemized in the MSCI Emerging Market Index. Sovereign credit rating history is made up of all foreign currency published announcements and ratings by Moody's, S&P and Fitch. All data collected is of daily frequency. Where applicable the data is denominated in US dollar for consistency.
The length of the study is driven by data availability post global financial crises of 2008. The study spans from 2015-2019 and 2009-2019 for the bond and stock market analyses respectively.

Standard event study methodology was employed. We selected the market model to calculate the return of a given security in relation to its market return. According to Campbell *et al.* (1998), this specification is superior. The market model has been employed to obtain the abnormal returns from long term bond yields and stock market returns. Two event window lengths were constructed, a long window to observe both anticipatory and lagging market reactions. A short window for a stricter measurement that avoids contamination by other economic news. T-statistics were used to test significance of the results. The overarching null hypothesis is that sovereign credit ratings have no significant impact on emerging bond and stock markets. Which is broken up into three segments. We tested abnormal returns for actual rating changes, signal announcements such as outlooks and watchlists, investment and non-investment grade ratings. In addition, these rating events are examined at an agency specific level to test the reputation hypothesis.

Chapter 4 presents the results of the market model tests conducted by tabling abnormal returns and cumulative abnormal returns. Each rating event is also graphically displayed in order to view abnormal returns throughout the event window.
For actual rating changes we reject our null hypothesis and find abnormal returns are not equal to zero for rating downgrades for both bond and stock markets. CAR values indicate that bond yields increase in response to rating downgrades. Stock market returns are negatively impacted by rating downgrades. Our results indicate that rating upgrades significantly impact emerging stock market returns positively. This is a rare finding in the literature. Albeit bond yields on average do not react significantly to rating upgrades.

Our second test looks at the impact of rating signal announcements. For the bond market we reject the null hypothesis and find abnormal returns from stable and negative outlooks and

watchlist announcements are not equal to zero. Furthermore, we find the magnitude and significance of outlooks and watchlists is greater than actual rating changes. This implies that signal announcements are more informative than actual ratings only in bond markets. In line with the literature there is a lack of significant evidence following positive outlook announcements.

Conversely, for emerging stock markets, we find significant evidence for positive and negative outlooks along with negative watchlists. Intriguingly abnormal returns are both positive and negative depending on event window length. In the case of stable outlooks, we fail to reject the null hypothesis and conclude that abnormal stock market returns are equal to zero.

Opposed to the bond market rating changes and preceding signal announcements in emerging stock markets are equally informative. To this end we largely agree with Pukthuanthong-Le *et al.* (2007) that stock returns are noiser which makes abnormal returns more difficult to interpret.

Moreover, it is evident that there are reputation effects between Moody's, S&P and Fitch in certain contexts. Markets react strongly to ratings issued by S&P and the least to ratings by Moody's. Fitch appears to have the most unique market response. Fitch is the only agency of the three which illustrated significant results for rating upgrades in both bond and stock markets.
Reputation effects diminish for ratings that cross the investment grade threshold. We find similar levels of significance in bond markets across all three agencies when investment grade is gained and lost. Institutional funds are restricted from holding non-investment grade bonds. Upon compliance the movement of these funds are likely to produce a notable change in bond returns as observed. Upgrading into investment grade matters less for emerging stock markets, with the exception of upgrades from S&P. This evidence confirms the regulatory influence of these types of events on market returns.

Overall, bond and stock markets react significantly more to negative than positive sovereign rating events. Negative sovereign rating news is negative news for both bond and stockholders as illustrated by the direction of returns. Rating outlooks and watchlists are more informative that actual ratings for emerging bond markets, but equal in emerging stock markets. Results are qualitatively and quantitively different across all three credit rating agencies in certain

circumstances. Emerging markets appear to respond strongly to announcements by S&P and the weakest to announcements by Moody's. Interestingly markets respond uniquely to Fitch ratings. Rating changes that determine investment grade status impact bond markets returns in the expected direction. Only investment grade downgrades significantly impact stock market returns. Abnormal returns are found on different days in the event windows, and at times trending in opposite directions. It is important to be careful when interpreting results of wider windows to avoid misleading findings.

The aim of this research was to estimate the relationship between various sovereign credit rating announcements, and bond and stock market returns. This was achieved through an event study analysis. The second aim was to ascertain if a differential impact between bond and stock market returns exists. By conducting parallel event studies it was deduced that bad rating news is bad news for both bond and stockholders, however these markets do not respond identically. The third aim was to address the question, does it matter who provides the rating. The study answers the question by assessing each of the three CRAs and concludes that is does matter, S&P has the strongest reputation. In conclusion sovereign credit ratings generally are informative and provide emerging markets with tradable information. One rationale as to why rating events are informative was provided by Ho and Michaely (1988) who state that if marginal costs of collecting and processing data exceed marginal benefits, market valuations will not incorporate all publicly available information. Therefore, the impact observed from rating events suggests that rating agencies provide information at lower costs and rating announcements constitute new information.

5.2. RECOMMENDATIONS

An event study technique is both a functional and elegant statistical approach suitable for assessing the impact of sovereign credit ratings on market returns. Further studies on the subject matter will aid understanding emerging market capital flows. Our findings illustrate that negative rating events are bad news for both bond and stockholders. Christopher *et al.* (2012) explain that investors move funds into surrounding regions following downgrades rather than a simple re-weighting between asset classes. This spillover effect would be a valuable aspect to build onto this research.

Researchers should be encouraged to constructively experiment with multiple iterations of the event study design. One of the limitations of the current study are sample sizes for specific event studies conducted, in particular our watchlist and investment grade analysis. Future researchers should aim at including more watchlist announcements as well as more events including investment grade rating announcements. Different aggregation methods could also be explored to compare results to the currently used Cumulative abnormal returns (CAR). The current study results were presented for emerging markets as a group. There is merit in broadening the results obtained by testing country characteristics for potential differential market responses.

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