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The share price reaction to credit rating announcements on the Johannesburg Securities Exchange

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Abstract

This report examines the JSE for any inefficiency that may exist with regard to the information content of credit rating announcements. Specifically, it tests the extent to which credit rating actions have an impact on share returns; the extent to which the credit rating agency influences abnormal returns; and finally the extent to which firm size impacts abnormal returns within the context of credit ratings announcements.

An event study methodology was performed on 364 credit rating announcements of listed companies on the JSE between 1 January 2005 and 31 December 2013 in order to analyse the resulting share price cumulative average abnormal returns. These abnormal returns were then tested for significance at the 1 per cent significance level via a Monte Carlo bootstrap simulation.

The results of this report show that the JSE is indeed inefficient when pricing in new information that result from credit rating announcements, and this is evident in three separate pieces of informational content. First, in the long-run credit rating downgrades (upgrades) have a significant negative (insignificant positive) impact on abnormal returns. Second, the ratings announcements of Moody's, Standard & Poor's and Global Credit Ratings Co. all exhibit significant (negative) abnormal returns, whilst those of Fitch are positive in the long-run. Finally, smaller firms are found to generate significant (negative) abnormal returns within the context of credit ratings announcements in the long run.

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Keywords

Credit ratings; share price; event study; Johannesburg Securities Exchange

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

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PEARL VENKATRAMAN   **9 November 2015**

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1. INTRODUCTION TO THE RESEARCH PROBLEM

1.1. Research Problem

The Efficient Market Hypothesis (EMH) is considered the cornerstone of modern financial theory and implies that markets are efficient or, put differently, prices reflect all relevant information and it is therefore impossible for investors to 'beat the market' (Fama, 1965). The EMH also implies that "stock prices adjust very rapidly to new information" (Fama, French, Jensen & Roll; 1969).

In theory a company's credit rating announcement should add new information to the stock market as it contains both publicly available information (as found in balance sheet debt published in audited financial statements) and non-public information (sensitive internal company information that include projections and plans) (Choy, Gray, & Ragunathan, 2006).

However, despite the theories illustrated above, the evidence is mixed as to whether credit rating announcements do add new information to the market; and whether the market is indeed efficient as purported by the EMH. The following two sub-sections expand on the contradictory evidence (empirical and anecdotal) that exists today.

1.1.1. The information content of credit rating announcements

Academics find significant negative share price effects of credit rating downgrades and weak or insignificant effect of upgrades to share price movements (for example Bannier & Hirsch, 2010; Barron, Clare & Thomas, 1997; Chung, Frost & Kim, 2012; Gu, Jones & Liu, 2014). However, despite prior studies that show an expected reaction of the share price to these announcements, an emergence of business and news publications show a weakened reaction of share prices to credit rating announcements in both developed and developing countries:

- Moscow-listed shares held ground after Standard & Poor announced a downgrade of Russia's sovereign rating to 'junk' status (Reuters, 2015);

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- Moody's first ever rating downgrade of UK debt came as a surprise not because it had occurred but that it had such little effect in the market (The Economist, 2013);

- Share prices of South Africa's large commercial banks rose by four per cent despite a Moody's downgrade that same week (Kruger, 2014);

- An announcement of a downgrade by Fitch to South Africa's sovereign risk rating created only a 'muted' reaction in the market due, in part, to investor expectations of Fitch to display copycat behaviour to that of Moody's and Standard & Poor's (I-Net Bridge, 2013).

Given mixed evidence that credit rating announcements add new information to the market, we examine the efficiency of Africa's largest stock market, the Johannesburg Securities Exchange ("the JSE") with regard to the speed and extent of processing the information content of credit rating announcements.

1.1.2. Market efficiency on the Johannesburg Stock Exchange

Bhana (1994) states that market efficiency on the JSE is a matter of degree. He borrows from the works of Fama (1970) in which the degrees of market efficiency can be characterized as strong form-; semi-strong form-; or weak form-efficient. These "three nested information sets" (Bhana, 1994, pg. 80) range from perfectly efficient (in which no investor can earn excess abnormal returns) to outright inefficiency (in which superior abnormal performance is available to any investor).

Affleck, Graves and Money (1975) in their appraisal of the efficiency of the JSE, conclude that the JSE can be regarded as efficient. Despite Roux and Gilbertson (1978) showing characteristics of inefficiency on the JSE, they demonstrate that superior abnormal returns cannot consistently be achieved. In addition, Bhana (1994) finds similar evidence of market efficiency, in which he states that "the market is marginally inefficient for some investors but unassailably efficient for most" (Bhana, 1994, pg. 95).

Firer, Ward and Teeuwisse (1987) find that in well traded markets like the JSE, prices are unlikely to diverge, to a large extent, from their intrinsic values for a prolonged period of time. They mention that many analysts therefore spend a considerable amount of time trying to identify 'major turning points' in the market.

In other works, Firer, Ross, Westerfield and Jordan (2012) state that any conclusions drawn about the efficiencies of larger stock exchanges such as the New York Stock Exchange or the London Stock Exchange may not apply to smaller markets such as the JSE due to "at least some of the shares [being] traded infrequently" (Firer et al., 2012, p. 387). The phenomenon of less frequently traded shares may mean that the latest share prices may not reflect the latest available information.

As is evident from empirical research, academics are yet to agree on the efficiency of the JSE, however most find that the market is semi-strong form-efficient, or put differently, market inefficiencies do exist. Academics that do believe the market is inefficient continuously look for events that not only take place in the market but also hold new information. These events assist investment analysts to earn abnormal returns attributed to the share price responsiveness to such information (Jensen, 1967).

If the JSE is semi-strong form-efficient, then the question becomes how quickly, and to what extent, do credit rating announcements add new information to the market?

1.2.   Research Objective

The objective of this research report is to determine the speed and extent to which credit rating announcements of listed companies on the JSE add new information to this stock exchange. In particular, this research examines whether credit rating announcements for companies listed on the JSE, in the nine year period from 1 January 2005 to 31 December 2013, significantly impact the share price performance of the rated company.

When examining a credit rating announcement, three particular features of the rating will be analysed when determining an announcements impact on abnormal returns:

(i) The rating action. Rating actions are typically indicated by an Upgrade, Downgrade, Assign, Affirm or Withdraw rating;

(ii) The rating agency. In South Africa, the Financial Services Board had registered four agencies during the period of analysis. These agencies were Moody's Investor Services, Standard & Poor's, Fitch and Global Credit Rating co.; and lastly

(iii) The firm size. All rated firms were ranked by their market capitalisation at the time of the study in order to classify each as either a large, medium or small firm.

When analysing a credit rating announcement, the speed at which the information content of the announcement is incorporated into the share price is determined by the days lapsed before a significant (positive or negative) abnormal return is observed.

The extent to which the information content is incorporated into the share price is determined by the length of the 'run' (as measured in event days) of the abnormal returns achieved.

1.3. Research Scope

The scope of this research report is limited to credit rating announcements made for South African listed firms on the JSE. The size of the firms varied from those with small market capitalisations to those with large market capitalisations. However, the decision criteria of whether to include a firm were based on the following:

- The firm must have been publicly listed on the JSE All Share Index (ALSI) at least once within the period 1 January 2005 to 31 December 2013 and have a unique share ticker code; and

- A credit rating announcement must be publicly made for the firm in question by any one of the four registered Credit Rating Agencies (CRA) in South Africa; and

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- The credit rating announcement must be made at the issuer level for the firm's long-term local, currency debt issues. This decision was taken because most credit ratings were announced either only for long-term debt at the issuer level or for both long- and short-term debt on the same date.

1.4.   Research Aim

In achieving the objective of determining the long-run share price reaction to credit rating announcements, the aim of this research report is to contribute to existing corporate and investment finance literature. The contributions made by this research report can be distinguished from other studies in three ways:

- Firstly, it is the only known South African event study to determine the impact of credit rating announcements on the JSE;

- Secondly, no published event study was noted that considered the impact of the credit rating agency, Global Credit Ratings Co. in its analysis;

- Thirdly, it is one of a few studies internationally that considered the impact of firm size in its analysis; and

- Lastly, it is one of few South African studies to adopt a robust Monte Carlo bootstrap simulation when testing cumulative average abnormal returns for significance at the 1 per cent level. Most other studies use simpler Market models or Capital Assets Pricing Models (CAPM).

1.5.   Conclusion

This chapter provided an overview of the research problem in so far as it extended to market inefficiencies on the JSE and the information content of credit rating announcements. The objective of this study was highlighted within the context of addressing the research problem, taking care to outline the scope and aim of the research report in the pursuit of meeting the research objectives.

2. LITERATURE REVIEW

Chapter two focuses on the historic importance of CRAs and their ability to provide a creditworthiness indicator of firm-level debt. It tracks the CRAs journey of changing business models, reputational challenges and the emergence of a sacrifice of ratings timeliness for ratings stability post the financial crisis. Specifically, this chapter focuses on the reaction that financial markets have to credit rating announcements and the potential of these CRAs to be overtaken by other lead indicators of creditworthiness in the market.

2.1. The origins of credit rating agencies

Access to funding for the size and magnitude of U.S. railroad projects into settled and unsettled areas of the United States of America in the late 1820s proved to be difficult. Railroad corporations could not raise adequate capital through local banks due to their unwillingness or inability to do so. And the only way to obtain this debt was to create an international corporate bond market in the bonded debt of U.S. railroad corporations (Sylla, 2001).

During this period, international investors and lenders needed a mechanism to receive financial and credit information on unfamiliar U.S. borrowers; and equity shares of corporations. This led to the emergence of three key developments: Credit Reporting Agencies (which provided information on a business's suppliers and customers); the Specialized Financial Press (which published systematic information on company balance sheet details); and the Investment Banker (who was responsible for monitoring the affairs of the company). Consequently spotting an innovation, John Moody of rating agency Moody's was the first to publish publicly issued bond credit ratings for railroad corporations (White, 2010a) which conveniently performed the same function of all three key developments combined (Levich, Majnoni, & Reinhart, 2002).

2.2. The popularization of credit ratings in global stock markets

A credit rating is an opinion expressed by a Credit Rating Agency of the ability of a

company to repay its debt obligations and is thus a measure of the creditworthiness of its balance sheet debt; complex debt instruments and/ or non-balance sheet debt (Cherny, 2014). Such credit ratings are issued by for-profit rating firms which in South Africa must be registered with the South African Financial Services Board (FSB) in accordance with Section 5(1) of the Credit Rating Services Act, 24 of 2012.

The FSB recognized Fitch, Global Credit Rating Co., Moody's and Standard & Poor's as CRAs in South Africa (Financial Services Board, 2014). (The request for deregistration from the FSB by Fitch on 4 September 2015 was noted (Vollgraaff, 2015) however all relevant historical news and ratings from Fitch were considered in this research report.)

In the early 1900s, at a time when information was not readily available as it is today, and standard formats of information were almost non-existent, standardized credit ratings from these agencies were meeting a large market need for information symmetry (White, 2010b).

Today, investors use the services of the CRAs so that they do not have to do their own in depth investigation of instruments that require time and expert knowledge (Amtenbrink & de Haan, 2009) whilst at the same time not relying on the biased view of the issuer (Keller & Stocker, 2010). A change in a company's credit rating has a direct impact on the borrowing costs of capital for the firm being rated (Paudyn, 2012). Equity investors as shareholders are also aware that in a situation of poor creditworthiness, debt has the prior claim on assets and earnings, whilst equity takes the residual claim (Myers, 2001). Thus the increased risk to shareholders as a result of default means that outsourcing this critical task to a widely-used third party is preferred.

Paudyn (2012) stated that roughly during the period of the early twentieth century, many U.S. banks were failing and regulation was passed in the 1930s to ensure that banks only bought safe or 'investment-grade' assets. These investment-grade assets had to be recognized by what was later called "Nationally Recognized Statistical Rating Organizations" or NRSROs (White, 2010b). This regulation, passed by the U.S. Securities Exchange Commission (SEC) in 1939, according to White (2010b), endowed CRAs with 'the force of law' and thus ultimately endorsed Moody's Investors Services; Standard & Poor's; and Fitch.

Essentially this one act not only popularized the use of credit ratings but mandated

them; giving the underlying agencies power over the corporate bonds market, both in the United States of America and internationally. The next section outlines how the power gained by these CRAs appears unwanted and the emergent changing business model that followed.

2.3. The dilemma and contradiction of using a CRA

In their assessment of the appropriateness of regulators that rely on private sector credit ratings to determine investment prohibitions and capital requirements, Cantor and Packer (1997) state that The Financial Institution Recovery and Reform Act of 1989 placed a ban on savings and loan institutions from investing in below-investment grade debt. In addition, they also state that other institutional investors, like pension funds and mutual funds, do not invest in speculative, below-investment grade bonds. White (2012) defines 'investment grade' rather loosely as a term used by CRAs to denominate a class of security.

By contrast however, Standard & Poor's (2015) state in their terms of use that "users of the information provided […] should not rely on any of it in making any investment decision". Similar content, as shown in appendix A, can be found within the Terms of Use on Moody's and Fitch websites.

2.4. The changing business model of credit rating agencies

With this rise in power of CRAs, a different business model has emerged. Initially, CRAs adopted an "investor-paid" business model, or sometimes referred to as purchaser-subscriber model (Cane, Shamir, & Jodar, 2012) in which the investor who requested the bond ratings would be the agencies main source of revenue (Jiang, Stanford, & Xie, 2012). However, over time, ratings were seen to be a public commodity that added to 'public good' (Duan & Van Laere, 2012) and so the model morphed from the prior "investor-paid" model to the current "issuer-paid" model (Paudyn, 2012).

In this model, the bond issuer pays for the company rating, and not the investor. The rationale for doing so is based on the increased 'free riding' behaviour from market

participants as a result of publicly available ratings, the cost of which is born entirely by the first requesting investor (Cane et al., 2012). Initially, free riding contributed to lower revenues for Standard & Poor's, fuelling concerns about the quality of the agency's ratings based on fewer resources (Jiang et al., 2012). This further supported the stance to shift towards an issuer-paid model.

The resulting conflict of interest that naturally arises, has been both acknowledged and defended by the U.S. SEC (2003, p.23), in which it states that the CRAs have effectively managed the conflict. Rating Agencies themselves say that they are in the "integrity business" (House, 1995) and it would be counter-productive to deliberately destroy the foundation of their business model (Jiang et al., 2012).

However, despite the rating agencies' expectation of being around for a long time (and thus being constrained to behave opportunistically or inappropriately) and the U.S. SEC's defence of these agencies, Buiter (2007, p.4) states that "individual employees of rating agencies can be here today, gone tomorrow". Partnoy (1999, p. 652) further supports that both Moody's Investors Services and Standard & Poor's have a high rate of staff turnover.

Given the conflict of interest that is outlined in this section, the resulting inaccuracy of credit ratings is explored in the next outlining the potential reasons for these inaccuracies.

2.5. The reasons for CRAs publishing inaccurate rating information

CRAs and the credibility and use of these agencies have received much attention in past years amongst both developed and developing countries. The common view expressed by many academics is that CRAs are to blame, in part, for the 2008 financial crisis and even for those prior to this event(Altman and Rijken, 2004; Crouchy, Jarrow and Turnbull, 2008; Mullard, 2012; Verschoor, 2007; Wessendorf, 2009; White, 2010a). As a result of this, they have lost credibility from the investment community in their ability to provide an accurate and unbiased opinion on the creditworthiness of a company.

Partnoy (2007) explains that CRAs are different from typical gatekeepers because they

earn economic rents even when they perform poorly and their guaranteed existence is a result of regulation that enforces all credit ratings to be issued by NRSROs of which they form part. The criticism of CRAs on this poor performance manifests threefold, according to Xia (2014), (i) their inability to accurately predict defaults; (ii) they lack appropriate timing in the publishing of a rating; and (iii) they are unresponsive to market based risk measures. Such criticism of CRAs has been further explored by academics, with a heightened focus on these inaccuracies post the financial crisis of 2008.

The first reason for inaccurate ratings information is an incentive that exists for CRAs to overstate the instrument's creditworthiness because they are remunerated by the issuer of the instrument and not the investor (Amtenbrink & de Haan, 2009; Harper, 2011; Purda, 2011; Skreta & Veldkamp, 2009). Amtenbrink and de Haan (2009) attribute this to the agencies' pursuit of a good relationship with the issuer; however they acknowledge that if the rating agencies were to sustain a good enough long run reputation in the market, they would have to balance any short term gains against this objective.

Purda (2011) attempts to explain the inaccuracies in the ratings of the structured finance market by citing (Michaely, Thaler, & Womack, 1995) in which she states that a lack of transparency of pay-offs associated with the underlying security has been blamed. Perhaps, more importantly though, Skreta and Veldkamp (2009) attribute these inaccuracies to the incentive of the issuer to search for the most favourable rating from other competing agencies.

The second reason that arises is the inability or existing inertia of the rating agency to satisfactorily rate complex structured sub-prime debt and the resulting build up and unfolding of the 2008 financial crisis that ensued (Amtenbrink & de Haan, 2009; Harper, 2011; Mullard, 2012; Orhan & Alpay, 2011; White, 2010a). Orhan and Alpay (2011, p. 5) label these agencies' ratings as "inaccurate, tardy and thus unreliable". They also mention that much of the ratings were based on earnings that relied on cash flow estimates made on little more than an educated guess.

Mullard (2012) states that the mathematical models of the rating agencies were unable to absorb changing caveats of new mortgages as the model still relied on classic mortgage structures. He even goes as far as suggesting that not only did the rating agencies know that the models were outdated but that the agencies themselves were reluctant to change them. Harper (2011) further supports that CRAs did not perform

due diligence on the underlying mortgages of the mortgaged backed securities that they rated, yet these CRAs convinced the market that they were very knowledgeable.

A natural question thus arises, "Why did these CRAs not focus on simpler debt ratings if they were unable to rate such complex instruments?" Harper (2011) finds that there was sufficient profit incentives available as the margins on these complex instruments were higher due to fewer issuers.

The third reason for inaccurate ratings emerges as a result of a conflict of interest that is apparent when the same CRAs that provide issuers with credit rating services also provide consulting services to these issuers (Amtenbrink & de Haan, 2009; Harper, 2011; Bolton, Freixas & Shapiro, 2012; Rafailov, 2011). Rafailov (2011) questions the independence and neutrality of CRAs due to the frequency of providing creative suggestions to issuers so that they may improve their ratings. This act also makes the CRA more reliant on the issuer for sustaining their revenue model (Rafailov, 2011).

The high barriers to entry for competition in this industry provide yet another reason for the disincentive and thus inaccuracy of ratings (White, 2010a). White (2010a) further qualifies that this reason exists due to the burden of regulatory costs, and the natural disincentive for innovation and integrity as a result of this reduced competition.

Finally, Bar-Isaac and Shapiro (2011) find that accurate ratings are achieved by CRAs when appropriate incentive contracts are in place but decline in accuracy just before credit analysts leave to find alternate employment, typically at investment banks. They attribute this labour market incentive to three underlying reasons:

(i)   the higher expected payoff in the next period (typically characterised by a boom in the economy) provides enough incentive for analysts to increase their effort and provide more accurate ratings in this period;

(ii)   however, if the probability of the analyst getting a typically higher paying job at an investment bank increases, the payoff for accurate ratings decrease and so the CRA loses any higher return made from investment in the analyst; and

(iii)   rating accuracy is improved when there is a greater ability of the CRA to monitor the analyst or when the 'revolving door effect' of an analyst leaving

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for an investment bank forces the analyst to get more experience and work harder to increase the probability of the analyst actually getting the job.

An assessment of these ratings (regardless of their accuracy of their) and the empirical evidence of their impact on share price is next assessed.

2.6. The share price reaction to credit rating announcements

Various research reports consider the share price reaction to credit rating downgrades, upgrades or other similar events, for example Credit Watch alerts. Inevitably, an event study is employed to measure the impact of an event (credit rating announcement) on a company's share price. To do so, requires a calculation of an abnormal return (AR), which is the difference between the actual return and the expected return of any share. These ARs are then accumulated over the period in question to get a cumulative average abnormal return (CAAR). The CAAR is used to measure the share price reaction to credit rating announcements.

2.6.1. The share price reaction to credit rating downgrades

Of the studies investigated in this research report, all find that there is a statistically significant (negative) CAAR when assessing the impact of credit rating downgrades (or negative CreditWatch announcements) on share price performance.

Griffin and Sanvicente (1982) studied 46 credit rating downgrades between 1960 and 1971, focusing on a wide 12 month event window of [-11,+1]. Their results were based on the Fama and McBeth two-factor model and found that credit rating downgrades have statistically significant CAARs of − 0.17 per cent on the impact of the issuer's share price. Consistent with this finding, Barron, Clare and Thomas (1997) in the UK, Choy et al. (2006) in Australia, and Freitas and Minardi (2013) in Latin America have all found significant negative excess returns following downgrades.

Over the years, further insights have been gained into the nature and magnitude of the share price response to credit rating downgrades. Dichev and Piotroski (2001) studied a sample of 2 940 Moody's credit rating downgrades between 1970 and 1997. They

found an underperformance of negative abnormal returns following the rating action; and continuing into the second and third year following the downgrades. Moreover, downgrades underperformed in almost all the years of the sample, resulting from an "underreaction" (Dichev & Piotroski, 2001, p. 173) to the announcement of the downgrade, rather than from lower systematic risk.

A study conducted by Goh and Ederington (1993) found that not all downgrades are for the same reasons and thus do not reveal the same reaction from share returns. Using a sample of 243 downgrades in the mid-1980s with an event window that spanned [-30,+30] days, Goh and Ederington (1993) found that if the underlying cause of a downgrade was due to deteriorating financial prospects, the capital market would receive this as new information and as such cause a significant negative equity market reaction. However, if the underlying cause was due to a change in the firm's leverage then no significant market reaction was found.

Norden and Weber (2004) offer more insight into how strongly the common stock and Credit Default Swap markets respond to credit rating announcements. Over a five year period, beginning 1998, 198 downgrades were gathered and tested within a 180 day event window of [-90,+90]. The results were assessed individually per CRA, and found that both markets anticipate not only rating downgrades but reviews for downgrade as well. In addition, the largest negative CAARs were attributed to Moody's' and Standard & Poor's' downgrade announcements (when compared with Fitch).

Finally, Behr and Guttler (2008) analyse the stock market reaction to unsolicited ratings by CRAs. Unsolicited ratings are those that are neither requested nor paid for by the issuer. The study analysed 86 unsolicited credit rating downgrades from 1996 to 2005 over a narrow three day event window of [-1,+1]. The findings show a CAAR of -0.36 per cent for a 5 per cent level of significance. The results of this and other selected studies showing significant negative CAARs for credit rating downgrades are summarised and displayed in Table 1.

2.6.2. The share price reaction to credit rating upgrades

In contrast to the abovementioned impact of downgrades, ratings upgrades were shown, in many instances, to have a weak or insignificant impact on stock and bond

market performance (Griffin & Sanvicente, 1982; Hand, Holthausen, & Leftwich, 1992; Hite & Warga, 1997; Choy et al, 2006). Behr and Guttler (2008) do find an exception to that mentioned above, however they conduct their study on unsolicited upgrades performed by Standard & Poor's for the period 1996 to 2005. They speculate that a reason could be investors had even more positive expectations to that of the CRA and were therefore disappointed when Standard & Poor's published the new rating.

As expected, there were relatively fewer upgrades than there were downgrades historically and particularly within non-US markets. Barron, Clare and Thomas (1997) conducted research on a small sample size of 9 upgrades in the UK over a nine year period, and similarly Choy et al (2006) found 20 upgrades in a sample over a fifteen year period. A summary of selected research findings of share or bond price reactions to credit rating upgrades or Credit Watch listings are shown in Table 2 below.

Table 1: Summary of selected research findings of share or bond price reactions to credit rating downgrades / Credit Watch listings

Study	Market	Period	Event window	Sample size	CAAR (%)
Griffin and Sanvicente (1982)	Stock	1960-1971	[-11,1] months	46	-0.17**
Hand et al (1992)	Stock and Bond	1977-1982	[0,+1] days	205	-1.12
Goh and Ederington (1993)	Stock	1984-1986	[-30,+30] days	243	-0.76**
Barron et al (1997)	Stock	1984-1992	[0,+30] days	14	-5.36**
Hite and Warga (1997)	Bond	1985-1995	[-12,+12] months	346[a]	-1.55[a] ***
				317[b]	-1.29[b] ***
Dichev and Piotroski (2001)	Stock	1970-1997	[0, +365] days	2940	-0.10**
Steiner and Heinke (2001)	Bond	1984-1996	[-180,+180] days	356	-0.99***
Norden and Weber (2004)	Stock and CDS	1998-2002	[-90,+90] days	63[a]	-0.25[a] **
				88[b]	-0.13[b] **
				47[c]	-0.30[c] **
Choy et al (2006)	Stock	1989-2003	[-10,+10] days	49	-3.36*
Behr and Guttler (2008)	Stock	1996-2005	[-1,+1] days	86	-0.64**
Bannier and Hirsch (2010)	Stock	1991-2004	[-1,+1] days	1810	-3.1^***
					-1.89^^***
Jorion and Zhang (2010)	Stock	1996-2002	[0,+1] days	679	-1.7***
Chung et al (2012)	Stock	1992-2010	[-1,+1] days	409	-1.1***
Gu et al (2014)	Stock	2002-2005	[-7,+3] days	503	-7.76***

[a] This refers to the relevant metric for Moody's
[b] This refers to the relevant metric for Standard & Poor's
[c] This refers to the relevant metric for Fitch
^ CAAR for pre-watch list era
^^ CAAR for post-watch list era
*** Significant at the 1% level
** Significant at the 5% level
* Significant at the 10% level

Table 2: Summary of selected research findings of share or bond price reactions to credit rating upgrades/ Credit Watch

Study	Market	Period	Event window	Sample size	CAAR (%)
Griffin and Sanvicente (1982)	Stock	1960-1971	[-11,1] months	49	0.14
Hand et al (1992)	Stock and Bond	1977-1982	[0,+1] days	66	-0.07
Hite and Warga (1997)	Bond	1985-1995	[-12,+12] months	149[a]	-1.35[a]
				160[b]	0.89[b]
Dichev and Piotroski (2001)	Stock	1970-1997	[0, +365] days	1787	-0.01
Steiner and Heinke (2001)	Bond	1984-1996	[-180,+180] days	190	2.54***
Choy et al (2006)	Stock	1989-2003	[-10,+10] days	20	2.61
Behr and Guttler (2008)	Stock	1996-2005	[-1,+1] days	41	-0.66**
Bannier and Hirsch (2010)	Stock				0.018^
		1991-2004	[-1,+1] days	1112	0.05^^
Jorion and Zhang (2010)	Stock	1996-2002	[0,+1] days	473	0.12
Chung *et al* (2012)	Stock	1992-2010	[-1,+1] days	196	-0.1
Gu et al (2014)	Stock	2002-2005	[-7,+3] days	101	4.11

[a] This refers to the relevant metric for Moody's
[c] This refers to the relevant metric for Fitch
^^ CAAR for post-watch list era

[b] This refers to the relevant metric for Standard & Poor's
^ CAAR for pre-watch list era
*** Significant at 1% level
** Significant at 5% level

2.7. The emergence of new business models and policy changes for CRAs

Studies have shown that credit ratings are announced *after* a company shows distress and thus follow the market rather than lead it, negating its core function as a predictor of creditworthiness of an entity or country (Tichy, 2011). In addition, the conservative stance of CRAs, in which they sacrifice timeliness for rating stability (Gu et al., 2014), has led to a lag of these changes behind true changes in bond issuer's default risk (Loffler, 2005). An in depth study on the individual market participants, reveal that Standard & Poor's release results of rating changes in a more timely manner than Moody's Investor Services (Guttler, 2011).

2.7.1. Revenue Pools

The call for CRAs to move away from an 'issuer-paid' model and the expressed need for a new business model for these agencies has received attention from various institutions and scholars alike. The U.S. SEC and U.S Congress are two participants who are heavily invested in finding a sustainable solution (Cherny, 2014). U.S. SEC commissioner Elisse Walter has suggested setting up a 'revenue pool' from which rating agencies would be remunerated (Westbrook cited in Jiang et al. 2012) thereby circumventing revenue reliance from both the issuer and the investor. This view supports the notion that public goods should be funded by public institutions.

2.7.2. Less regulation for Credit Rating Agencies

White (2010b) argues against more regulation as a policy stance to correct the bad behaviours of CRAs. This argument states that more regulation will require more transparency in the ratings process thus eroding intellectual property of these NRSROs and in the long run, discourages future creation of intellectual property from these agencies. In addition, the higher costs that arise from additional regulation will create barriers to entry that discourage a more competitive business environment.

White (2010b) suggests that a solution to combat issues associated with more regulation of NRSROs would be to place less regulation on these rating agencies whilst

at the same time reducing the bond market's reliance of CRAs to provide them with a measure of their creditworthiness. He adds that these regulated financial institutions should, themselves, seek alternative measures for creditworthiness, subject to prudential oversight.

2.8. The emergence of new lead indicators for creditworthiness

Questionable usage of credit ratings, point to a need in the market for an alternative lead indicator of creditworthiness. Should regulators continue to rely on private "standard-setters", this reliance will create profits for the standard-setters regardless of how useful their information is and a paradox of profitable and thriving CRAs will exist in the midst of poor informational value delivered from such agencies (Flannery, Houston, & Partnoy, 2010).

2.8.1. CreditWatch listings

CreditWatch listings were first offered in November 1981 by Standard & Poor's in which it provided investors with information about potential changes in default risk prior to an actual change in credit rating (Wansley & Clauretie, 1985). Due to the informational content of changes in credit quality; Gu et al. (2014) found that CreditWatch listings and de-listings were tested as a timelier alternative of CRAs.

Gu et al. (2014) suggest that CreditWatch listings do signal potential changes in rating changes timeously, however these listings are still performed and communicated days after equity prices start to change in reaction to credit quality. This suggests that the market is reacting to another signal that behaves as a valuable predictor of the likelihood of default.

In addition, negative CreditWatch announcements generate significant negative stock market returns (Barron et al., 1997; Elayan, Maris, & Young, 1996; Gu et al., 2014; Holthausen & Leftwich, 1986).

2.8.2. Credit Default Swaps

Credit Default Swap (CDS) spread was investigated as a potential alternative to credit rating announcements. Credit Default Swaps, as described by Zhu (2006), are credit derivatives whose payoffs are linked to changes in the credit quality of the underlying asset. Weistroffer (2009) adds that based on the terms of the financial contract, the protection seller will only pay the protection buyer of the instrument in the happenstance of the "insured event" the protection seller has the obligation to settle the contract either via a physical settlement or a cash settlement.

Figure 1: CDS settlement model (Weistroffer, 2009)
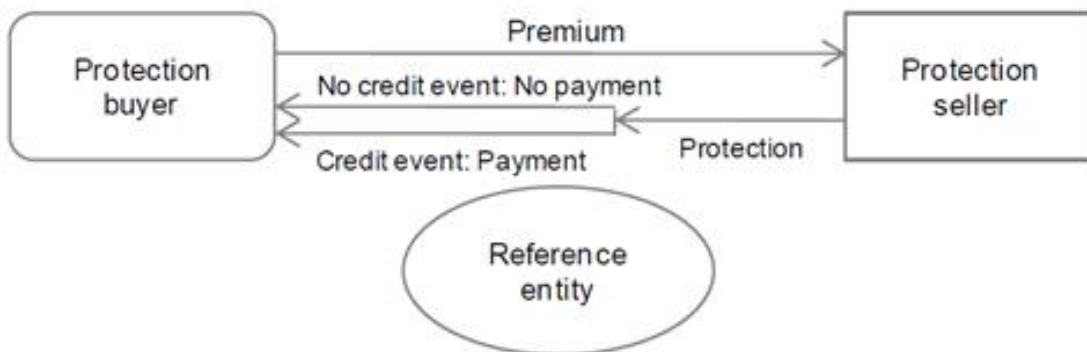
Flannery, et al. (2010) show that CDS spreads are positively correlated to the likelihood of default of a firm and negatively correlated to the movement in share price of the same firm. They also find that at a minimum, CDS spreads reflected information more timeously and accurately than credit rating announcements. Predescu, Hull, & White (2004) further support that both CDS spread changes and CDS spread levels provide useful indicators in estimating the probability of negative credit rating changes. Finally, Zhu (2006) found the CDS market to lead the cash market and thus prove that CDS premiums are a lead indicator of bond yield in the cash market.

Had investors scrutinized CDS spreads to assess the riskiness of financial institutions during the financial crisis of 2008, Flannery et al. (2010) are convinced that they would have seen evidence for the risk of default as early as July 2007.

Emerging markets have been found to have lower levels of liquidity when compared to that of developed markets (Lesmond, 2005; Chataika, 2014). The JSE, whilst the

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largest and most liquid of all African markets, has what is considered by KPMG (2013a) to be, low levels of liquidity and extensive market breadth of its CDS market thus making it difficult to source accurate probabilities of default. Chataika (2014) effectively discourages the use of CDS spreads as a tool for signalling creditworthiness on the JSE due to the lack of liquidity on this exchange; but also the resulting disparities in the price to book value, unmet portfolio requirements and deterrence of foreign trade.

2.8.3. Auditing firms and Auditors

According to Cherny (2014), auditors are in a superior position to that of CRAs due their informational advantage when it comes to assessing the creditworthiness of balance sheet debt. Traditional CRAs that provide this opinion rely on unverified external information whereas Auditors have access, through formal mandate, to deeply analyse all the elements of the company including the internal and external components. This includes management estimates within public financials that are not only subjective but to a Credit Rating Agency, the implications of which are even more difficult to assess without internal interrogation (Samson, 2006).

Essentially, an auditor's requirement for evaluating the going concern of a company and the objective of a Credit Rating Agency are similar in form but different in practice as elaborated upon by Hu (2011). The natural alignment in objectives suggests that an auditor, with an extension of mandate, could provide assessments of credit quality via a rating issued for investor consumption (Hu, 2011).

However the approach of using auditing firms to replace or collaborate with CRAs is not without its flaws. Audit firms are also blamed for their contribution and role within the financial crisis of 2008. In addition to the auditing firms also adopting an "issuer-paid" business model, these firms did not adequately adapt the opinion of banks that were considered to be over-leveraged and subsequently failed to provide warnings that these entities would continue as going concerns (Sikka, 2009).

2.9. Conclusion of Literature Review

As shown in this literature review, an extensive amount of research has been done by

previous scholars on the history and emergence of CRAs (Levich et al., 2002; Sylla,2001; White, 2010a); the reasons for inaccurate ratings (Amtenbrink and de Haan, 2009; Bar-Isaac and Shapiro, 2011; Harper, 2011; Mullard, 2012; Orhan and Alpay, 2011; Purda, 2011; Rafailov, 2011; Skreta & Veldkamp, 2009); the alternative models for CRAs (Cherny, 2014; Jiang et al., 2012; White, 2010b); the alternative tools for gauging the creditworthiness of assets (Gu et al., 2014; Flannery, 2010; Weistroffer, 2009); and finally the resulting impacts of these credit rating announcements to share price returns (for example Barron et al., 1997; Jorion & Zhang, 2010; Norden & Weber, 2004).

Whilst the author acknowledges that there has been a considerable amount of research in both developed and emerging market stock exchanges on the share price reaction to credit rating announcements, no research to date has been done on these rating announcements and their impact on share prices on the JSE.

Given the observation that smaller markets like the JSE may not hold full information in all share prices at any one time (Firer et al., 2012), there is a case to assess how quickly and to what extent do credit rating announcements on this exchange affect share price returns.

3. RESEARCH HYPOTHESES

In this chapter the key outcome was to hypothesise the share price reaction to the features of a credit rating announcement. Most studies used common stock price returns in the equity market to measure the impact of an announcement on a company. Whilst others measured the impact of a credit rating announcement by analysing abnormal returns associated with bond and CDS markets.

This study measured the long term share price response to credit rating announcements in South Africa during the nine year period from 2005 to 2013. Traditional features of credit rating announcements were analysed, namely:

- The *action* of a credit rating announcement as indicated by a downgrade, upgrade, assign, affirm or withdraw action; and

- The influence of the CRA *brand* itself in the determination of the share price reaction, i.e. Moody's; Standard & Poor's; Fitch; and Global Credit Ratings Co.

This study was extended to consider one more potential explanatory variable of a credit rating announcement's impact on share price on the JSE, namely:

- The *size* of the firm being rated. The market capitalisation of firms on the JSE was used to classify each firm as small, medium or large in size relative to each other.

Considering the findings of previous studies and the additional potential explanatory variable of share price performance as stated above, three hypotheses were tested. Figure 2 illustrates the expected outcome of each hypothesis that was tested.

Figure 2: A diagrammatic representation of the hypotheses to be tested
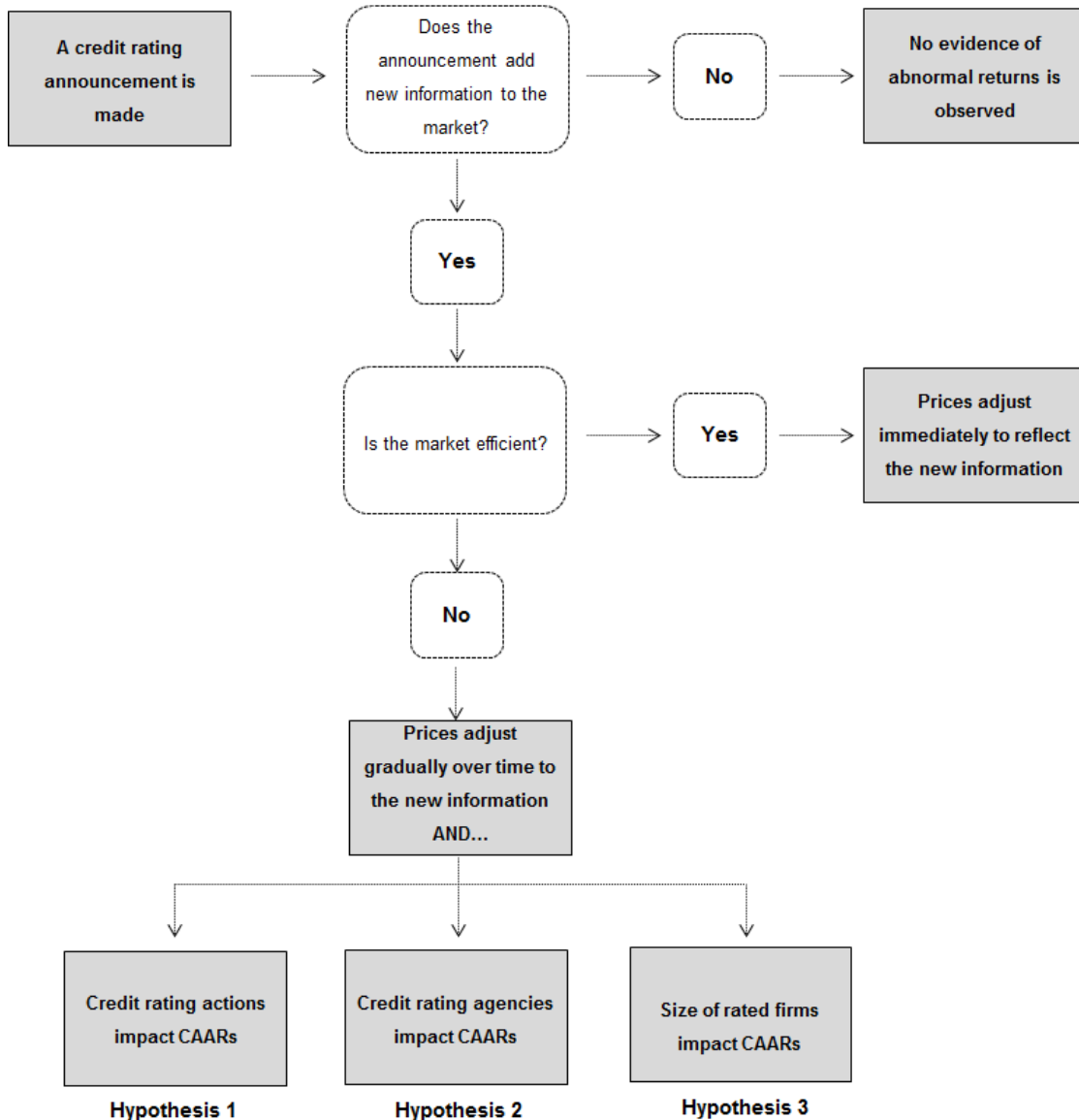
Hypothesis 1:

Evidence from Griffin and Sanvicente (1982) with a relatively small sample size of 95 announcements, showed a significant negative response of common stock returns to credit rating downgrades and insignificant positive responses to credit rating upgrades. In later works, Dichev and Piotroski (2001), with a sample size of 4 727, showed a delayed reaction of returns to downgrades albeit negative, and a similar finding to that of Griffin and Sanvicente (1982) for upgrades.

The null hypothesis for this study therefore stated that credit rating actions i.e. an upgrade (UG), downgrade (DG), assign (AS), affirm (AF) or withdraw (WD) do not cause abnormal share returns on the JSE around the credit rating announcement date. The alternative hypothesis therefore stated that a credit rating action does cause abnormal share returns on the JSE around the credit rating announcement date. Based on the studies outlined above we can further hypothesise that a downgrade (upgrade) has a negative (positive) impact on CAARs. A summary of Hypothesis 1 is shown in Table 3.

Table 3: Research Hypothesis 1

$H1_0$:	$CAAR_1 = 0$	Hypothesis 1 stated (null): Credit rating actions do not cause abnormal share returns on the JSE around the credit rating announcement date
$H1_{a1}$:	$CAAR_{DG} < 0$	Hypothesis 1 stated (alternative 1): Credit rating downgrades cause negative abnormal share returns on the JSE around the credit rating announcement date
$H1_{a2}$:	$CAAR_{UG} > 0$	Hypothesis 1 stated (alternative 2): Credit rating upgrades cause positive abnormal share returns on the JSE around the credit rating announcement date
$H1_{a3}$:	$CAAR_{AS} \neq 0$	Hypothesis 1 stated (alternative 3): Credit rating assignments cause abnormal share returns on the JSE around the credit rating announcement date
$H1_{a4}$:	$CAAR_{AF} \neq 0$	Hypothesis 1 stated (alternative 4): Credit rating affirmations cause abnormal share returns on the JSE around the credit rating announcement date
$H1_{a5}$:	$CAAR_{WD} \neq 0$	Hypothesis 1 stated (alternative 5): Credit rating withdrawals cause abnormal share returns on the JSE around the credit rating announcement date

Hypothesis 2:

Norden and Weber (2004) in their study within both the CDS and common stock market found that the largest negative CAARs were attributed to Moody's' and Standard & Poor's' review for downgrade announcements (when compared with Fitch).

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No study to date analysed the impact on Global Credit Ratings Co. on share price performance.

The null hypothesis therefore stated that the brand of a CRA is not a factor in explaining the CAARs on the JSE around the announcement date of a credit rating. The alternative hypothesis stated that the brand of a CRA is a factor in explaining the CAARs on the JSE around the announcement date of a credit rating. Based on the study outlined above we can further hypothesise that both Moody's and Standard & Poor's have a negative impact on CAARs. Table 4 shows a summary of Hypothesis 2.

Table 4: Research Hypothesis 2

H2$_0$:	CAAR$_2$ = 0	Hypothesis 2 stated (null): Credit rating agencies do not cause abnormal share returns on the JSE around the credit rating announcement date
H2$_{a1}$:	CAAR$_{MD}$ < 0	Hypothesis 2 stated (alternative 1): Moody's causes negative abnormal share returns on the JSE around the credit rating announcement date
H2$_{a2}$:	CAAR$_{SP}$ < 0	Hypothesis 2 stated (alternative 2): Standard & Poor's causes negative abnormal share returns on the JSE around the credit rating announcement date
H2$_{a3}$:	CAAR$_{FC}$ ≠ 0	Hypothesis 2 stated (alternative 3): Fitch causes abnormal share returns on the JSE around the credit rating announcement date
H2$_{a4}$:	CAAR$_{GC}$ ≠ 0	Hypothesis 2 stated (alternative 4): Global Credit Ratings Co. causes abnormal share returns on the JSE around the credit rating announcement date

Hypothesis 3:

Fama (1998) in his paper on market efficiency, long term returns and behavioural finance, found that smaller, more underfollowed firms were observed to have the most long-run abnormal returns where there is a greater potential for informational inefficiencies. In addition, Bernard and Thomas (1989) further support this conclusion based on a study in which they demonstrate that smaller firms exhibit stronger abnormal returns and market 'imperfections'.

The null hypothesis therefore states that company size is not a factor in explaining the CAARs on the JSE around the announcement date of a credit rating announcement. The alternative hypothesis states that size is a factor in explaining CAARs on the JSE around the announcement date of a credit rating action. A summary of Hypothesis 3 is shown in Table 5.

Table 5: Research Hypothesis 3

$H3_0$:	$CAAR_3 = 0$	Hypothesis 3 stated (null): The firm size of the rated entity does not cause abnormal share returns on the JSE around the credit rating announcement date
$H3_{a1}$:	$CAAR_{LC} \neq 0$	Hypothesis 3 stated (alternative 1): Large-cap firms cause abnormal share returns on the JSE around the credit rating announcement date
$H3_{a2}$:	$CAAR_{MC} \neq 0$	Hypothesis 3 stated (alternative 2): Mid-cap firms cause abnormal share returns on the JSE around the credit rating announcement date
$H3_{a3}$:	$CAAR_{SC} \neq 0$	Hypothesis 3 stated (alternative 3): Small-cap firms cause abnormal share returns on the JSE around the credit rating announcement date

Market Efficiency:

In accepting or rejecting the null hypotheses as stated in this chapter, a deduction of market efficiency can be made about the JSE. This deduction is made upon an analysis of the speed and extent to which the JSE incorporates the information content of credit rating announcements into the share price returns.

4. RESEARCH METHODOLOGY

This chapter seeks to provide the appropriate research methodology that will be used in this study to address the hypotheses as stated in the previous chapter. It will provide an outline of the unit of analysis, population of relevance, sampling method and size, data collection, data analysis approach and any research limitations that may exist.

Saunders and Lewis (2012) recommend an explanatory study for the relationship between two variables. An experimentation strategy would be appropriate as it studies the causal effect of the independent variable or event (a credit rating announcement) on a dependant variable (share price) (Saunders & Lewis, 2012).

The purpose of this study is to measure the stock market's reaction to credit rating announcements made by the four credit rating agencies registered by the Financial Services Board within South Africa for the period 1 January 2005 to 31 December 2013. In order to do so, this study analysed the CAARs as a result of CRA announcements by way of an event study methodology.

4.1. Unit of Analysis

An event study requires the definition of a clearly defined unit of analysis known as the 'event'. The event in this report was a single credit rating announcement by any one of the four CRAs for South African listed equities on the ALSI between the period 1 January 2005 and 31 December 2013.

A credit rating announcement was issued by a CRA for a particular firm on a particular date. Each CRA provided a credit rating announcement for the firms they wished to rate (via solicited or unsolicited ratings). All credit rating announcements had multiple consistent features. The first feature was the rating action of the rating agency. Typically, if a firm had never been rated before by a particular rating agency, then the rating action stated 'Assign'. Once assigned, a rating either remained unchanged in the next announcement ('Affirm'); moved down one or multiple notches ('Downgrade'); or moved up one or multiple notches ('Upgrade') or is withdrawn ('Withdraw').

The second feature of a rating announcement was a rating outlook. In determining a rating outlook, consideration was given to any changes in the economic and/ or fundamental business conditions (Standard & Poor's, 2015). Typically, a CRA assigned an outlook that indicated a rating may be raised in the future ('Positive'), a rating may be lowered ('Negative'), or a rating was not likely to be changed ('Stable').

Thirdly, an announcement provided the actual rating allocated to the firm or its underlying debt instruments. Issuer credit ratings were an assessment of default risk and were based on three key principles (Standard & Poor's, 2015):

- The firm's likelihood of repayment (in both capacity and willingness) to meet its financial commitments in accordance with the terms of its obligations;

- The protection afforded by the obligation in the event of bankruptcy; and

- The relative seniority or ultimate recovery of debt in the event of default.

Finally, ratings were assigned to long term debt and short term debt, on both the issue and the issuer level. In South Africa, CRAs for the majority of instances, either announced short term debt ratings together with long term debt ratings or only announced long term debt ratings. In addition, the ratings were clustered to indicate relative risk of default. These clusters were defined on the basis of high credit quality ('Investment Grade') or low credit quality ('Non-Investment Grade'). A summary of these rating features are shown in Table 6.

Table 6: Summary of credit rating announcement features

Rating feature	Feature description	Feature options
Action	A direction from which the previous rating has moved.	Upgrade / Downgrade / Assign / Affirm
Outlook	An indication of the likely direction of a future rating action within a one- to two-year period considering any changes in economic and/ or fundamental business conditions (Standard & Poor's, 2015)	Positive / Negative / Stable / Developing
Symbol	An opinion expressed by a Credit Rating Agency of the ability of a company to repay its debt obligations and is thus a measure of the creditworthiness of its balance sheet debt; complex debt instruments and/ or non-balance sheet debt (Cherny, 2014)	AAA / AA / A / BBB / BB / B / CCC / CC / C [Standard & Poor's and Fitch] Aaa / Aa / A / Baa / Ba / B / Caa / Ca / C [Moody's] A1+ / A1 / A1- / A2 / A3 / B / C / LD [GCR Co.]
Class	An indication of relative risk of default based on a class of ratings and thus an indication of quality (Cane et al., 2012)	Investment Grade / Non-Investment Grade

4.2. Population of Relevance

The population used for this event study comprised all credit rating announcements made for publicly listed shares found on the JSE over the period 1 January 2005 to 31 December 2013. For the purposes of this study, only long term debt at the issuer level was analysed.

4.3. Sampling method and size

In South Africa, publicly listed companies are required to publish any material, non-confidential information or any non-material price-sensitive announcements on the Stock Exchange News Services (SENS) of the JSE in South Africa (KPMG, 2013b). The SENS ensures that price-sensitive announcements can be received timeously and simultaneously by investors and analysts (Ward & Muller, 2010).

Using the Sharenet database that contains all SENS announcements for the period, a content search was performed to extract all relevant credit rating announcements. An extraction of credit rating announcements from each of the CRA web sites was used to ensure no announcement was excluded. For the period 1 January 2005 to 31 December 2013, a total of 531 credit rating announcements were gathered.

Using an electronic JSE Bulletin database, share codes and corresponding share market capitalisations were gathered. All missing fields were removed, reducing the sample size to 418 announcements. Thereafter, each announcement was scrutinised for potentially confounding events as a result of corporate actions or releases of trading results taking place on the same day. This reduced the sample by a further 54 announcements to reveal a final sample of 364 announcements.

4.4. Data Collection

Once the population of relevance was selected, and hypotheses formulated, a process of data collection followed. All hypotheses tested CAARs for significance. A CAAR was determined from two key pieces of data, namely index returns and individual company

returns. The J203 Index (All Share Index) was chosen as it contained 99 per cent of the JSEs market capitalisation and was thus a good proxy for expected returns. Both the J203 daily index prices and daily company share prices were extracted from McGregor BFA Research Domain.

Credit rating announcements were required to test all three hypotheses. Specifically for hypothesis one and two, details on the direction of the rating announcement (indicated by an upgrade, downgrade, assign or affirm rating) and the CRA that issued the rating announcement (indicated by Moody's, Standard & Poor's, Fitch or Global Credit Ratings Co.) were required. These features of a credit rating announcement are published on the JSE SENS and were extracted from the ShareNet 'JSE News' database. Rating announcement data was also extracted from each of the CRA websites to test the robustness of ShareNet data.

Market size was a requirement for hypothesis three. Market size was indicated by the market capitalisation of the firms being rated and was obtained at the end of the month that a rating was made through an electronic database housing all data from the JSE Bulletin. The market capitalisations of all rated firms were ranked from largest to smallest and classified into three groups. The largest one-third of the list was classified as 'large-cap', the middle one-third of the group was classified as 'mid-cap', and the smallest one-third of the group was classified as 'small-cap'.

4.5.   Data analysis approach

An event study is an measures the valuation effects of a corporate event, such as a credit rating announcement, by examining the response of the share price around the announcement of the event (Brown & Warner, 1980) and was first used by Fama et al., (1969), in which they tested the speed of adjustment of prices to specific kinds of new information. They found excess returns or "residuals" (Fama et al., 1969, p. 5) by subtracting the expected returns of a share from its actual share price. A traditional event study is an established time series methodology that is necessary to analyse the impact of these changes on the abnormal returns of equity stocks on the JSE similar to that used by Bhana (2010) and Ward & Muller (2010).

To perform an event study, key steps within this research method were adopted,

namely (i) definition of the event date; (ii) definition of the event window; (iii) estimation of the abnormal return; and (iv) test abnormal returns for significance.

4.5.1. Definition of the event date

The event date chosen was the date of the credit rating announcement. This date was defined as time period '0' (t_0) in the event model.

4.5.2. Definition of the event window

Firer et al. (2012) state that any conclusions drawn about the efficiencies of larger stock exchanges such as the New York Stock Exchange or the London Stock Exchange may not apply to smaller markets such as the JSE due to "at least some of the shares [being] traded infrequently" (Firer et al., 2012, p. 387). The phenomenon of less frequently traded shares may mean that the latest share prices may not reflect the latest available information.

This study did not assume that the JSE is efficient and hence the event window in question is relatively longer to account for delays with information transfers. To further account for any information leakage or the market reaction to other indicators that preceded a credit rating announcement the event window included a prior period to the event date. The event window was thus chosen as [-60; +200] days.

4.5.3. Estimation of abnormal returns

According to Bhana (2010) a long run study such as that chosen is appropriate for two reasons. Firstly, a long-run study would dispute any criticisms that credit rating announcements are short term in nature, in which they overreact to news once published but then correct in the long-run by subsequently reversing these overreactions. Secondly, it is only in the long-run that one can see the "full magnitude, speed and permanence" (Bhana, 2010, p. 3) of market reactions to the said event.

There are however two major problems with a long run event study. First, confounding events are more likely to affect the long run returns and thus to avoid this problem as far as possible, any announcement on SENS that occurred on the same date as a credit rating announcement was removed. Secondly, there is difficulty in estimating abnormal returns over long periods. Lyon, Barber and Tsai (1999) find that misspecification of test statistics can be avoided through the use of a carefully constructed reference portfolio and tested for significance against a bootstrapped skewness-adjusted t-statistic.

A database of historical daily abnormal returns for the JSE was used in this study, and was estimated upon the construction of a twelve factor control portfolio as explained in detail by Ward and Muller (2010). These daily abnormal returns were averaged and then accumulated to obtain a CAAR for each share over the event window period.

4.5.4. Test for significance

The CAARs in this study were tested for significance, however a simple t-test was inappropriate as an assumption would have to be made of normality (Ward & Muller, 2010). The AARs were accumulated to obtain CAARs and thus no longer fitted a normal distribution curve. The Monte Carlo method proved a more appropriate test and involved the creation of a 'bootstrap' distribution. The bootstrap distribution enabled the sample estimates to be tested for accuracy through the use of confidence intervals.

The construction of a bootstrap distribution involved the following steps:

- A random selection of a trading day, that fell prior to and outside of the event window, was selected and assigned to the first share. For the purposes of this study the period t-360 to t-120 was chosen as depicted in Figure 3. This was repeated for each observation in the sample;

- CAARs were then calculated and stored for these random event dates and their surrounding event windows. Once stored, a simulation was applied to repeat the process of obtaining random event window CAARs one hundred times;

- These CAARs were ranked to obtain the 1st and 99th percentile which became

the lower and upper confidence limit respectively of the sample;

- The actual event CAARs were plotted against the bootstrap to see if the distribution fell within the 99 per cent confidence limit.

Figure 3: A graphical depiction of the Monte Carlo boot-strap window
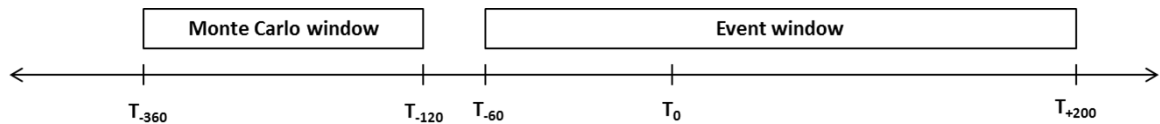
4.6. Research limitations

The research conducted in this report had certain limitations, including the following:

- It focused on credit rating announcements that were issued to companies listed on the JSE and is therefore not representative of credit rating announcements that were issued to unlisted companies or those that belonged to other exchanges;

- It focused on credit rating announcements made during the period 2005 to 2013 and is therefore not representative of announcements made during all time periods;

- It focused on credit rating announcements that were issued for long term local currency debt only, and is therefore not representative of credit rating announcements that were made to other debt instruments or made in other currencies;

- It ignored the possible differences between credit rating announcements due to changes in firms' financial prospects and those due to changes in firms' leverage (Goh & Ederington, 1993);

- It was a multi-industry sector study and ignored the possibility that credit rating announcements in some industries may cause different share price reactions to those in others.

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5. RESULTS

5.1. Description of sample

A final sample of 364 events was analysed, after adjusting for missing data and confounding events. A summary of the sample is displayed in Table 7 in which the sample is sliced according to various independent variables to show a distribution of credit ratings.

Table 7: Summary of credit rating announcements for listed companies on the JSE between 2005 and 2013

Sample size	**364**	**100%**
Frequency of ratings within year of occurrence	**364**	**100%**
2005	34	9%
2006	33	9%
2007	31	9%
2008	52	14%
2009	46	13%
2010	49	13%
2011	42	12%
2012	36	10%
2013	41	11%
Frequency of rating action	**364**	**100%**
Upgrade	16	4%
Downgrade	68	19%
Assign	75	21%
Affirm	197	54%
Withdraw	8	2%
Frequency of outlook announcement	**364**	**100%**

Positive	30	8%
Negative	57	16%
Stable	235	64%
Rating Watch	32	9%
Blank	10	3%

Frequency of Credit Rating Agency	**364**	**100%**
Moody's	51	14%
Standard & Poor's	38	10%
Fitch	115	32%
Global Credit Ratings Co.	160	44%

Average market capitalisation of Credit Rating Agency	
Moody's	R 88 325 656 018
Standard & Poor's	R 149 118 871 438
Fitch	R 52 802 079 119
Global Credit Ratings Co.	R26 930 675 096

Total sample market capitalisation statistics	
Mean	R 56 599 879 842
Median	R 19 845 366 720
Range	[R0.29 billion : R568 billion]

The following noteworthy observations were found in the total sample description:

- When distributed by year of occurrence, 2008 to 2010 displayed a three-year consecutive period where the highest ratings per year were observed. More than half of the ratings (n=79) during this period were announced as 'Affirm';

- The majority of all credit ratings were attributed to 'Assign' and 'Affirm' positions from the South African CRAs;

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- An overwhelming 64 per cent of all ratings that were performed (n=235) exhibited a 'Stable' outlook from the CRAs;

- 75 per cent of all sample ratings were issued by Fitch and Global Credit Rating Co.;

- A further analysis of the sample mean indicated that both Standard & Poor's and Moody's typically issue credit ratings for larger market capitalisation firms. In addition, large-cap firms skew the sample mean to the right of the sample median by almost three times.

Before any of the hypotheses were tested, the sample data collected was tested for validity and reliability using the approach as outlined in Saunders and Lewis (2012). Both tests were performed in order to enhance the credibility of the research findings and conclusions.

5.2. Data Validity

Data validity as explained by Saunders and Lewis (2012) refers to the extent to which (i) the data collection method accurately measures that which it was intended to measure and (ii) the research findings concur with what they profess to be about. The elimination of five principal factors that threatened the validity of the data was considered. These factors are discussed below.

Subject selection

To prevent errors with incorrect subject selection, sample data was compared to that of data collected in other studies researching the same topic. This research report utilised traditional data features (credit rating actions and agencies) necessary for answering traditional hypotheses (Hypothesis 1 and Hypothesis 2) as well as additional, non-traditional but relevant data features (company size) as was relevant for Hypothesis 3.

History

All credit rating announcements that were made on the same day as any other SENS

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announcements on the JSE were removed from the sample to ensure that the share price reaction was not impacted by known and traceable confounding events.

Mortality

Survivorship bias, as explained by Grinblatt and Titman (1989) occurs when a test is performed only on the sample of surviving funds or shares versus a test on the entire universe of funds. To avoid survivorship bias, all delisted shares within this period were included in the data.

Testing

Testing refers to any effects that the data collection process itself may have on the subjects (Saunders & Lewis, 2012). Credit rating announcements are referred to as secondary, public and non-human data. The data collection process of this secondary data involved the automated downloading of electronic databases from Sharenet and SENS.

Ambiguity regarding causal direction

No ambiguity regarding the causal direction of events within this research exist as the date of a credit rating announcement always preceded the share price reaction that was analysed. The actual dates of the announcement coincided on all portals where this information was retrieved, thus removing any ambiguity concerning the specific event date in question.

5.3.   Data Reliability

Data reliability refers to the extent to which data collection methods and analysis procedures will produce consistent findings (Saunders & Lewis, 2012). In order to eliminate subject error as a result of incorrect credit rating announcements captured and published on Sharenet, data was collected directly from ShareNet and SENS databases and thereafter cross checked against the same data that existed on the source CRA website portals for robustness and completeness. The data was collected

and stored without undergoing any transformation.

In addition, spaghetti graphs were generated to check for any obvious data problems. These spaghetti graphs were constructed by accumulating each observation's AARs to obtain a CAAR per observation row. The CAARs for all 364 observations are shown in Figures 4 and 5. The point on the graphs at which all observations' CAARs converge is the event date, day t_0. No CAAR deviated significantly from the average, implying that there were no obvious data issues impacting the results of this research report.

Figure 4: Spaghetti graph showing individual observation CAARs [Share ASA to MTN]
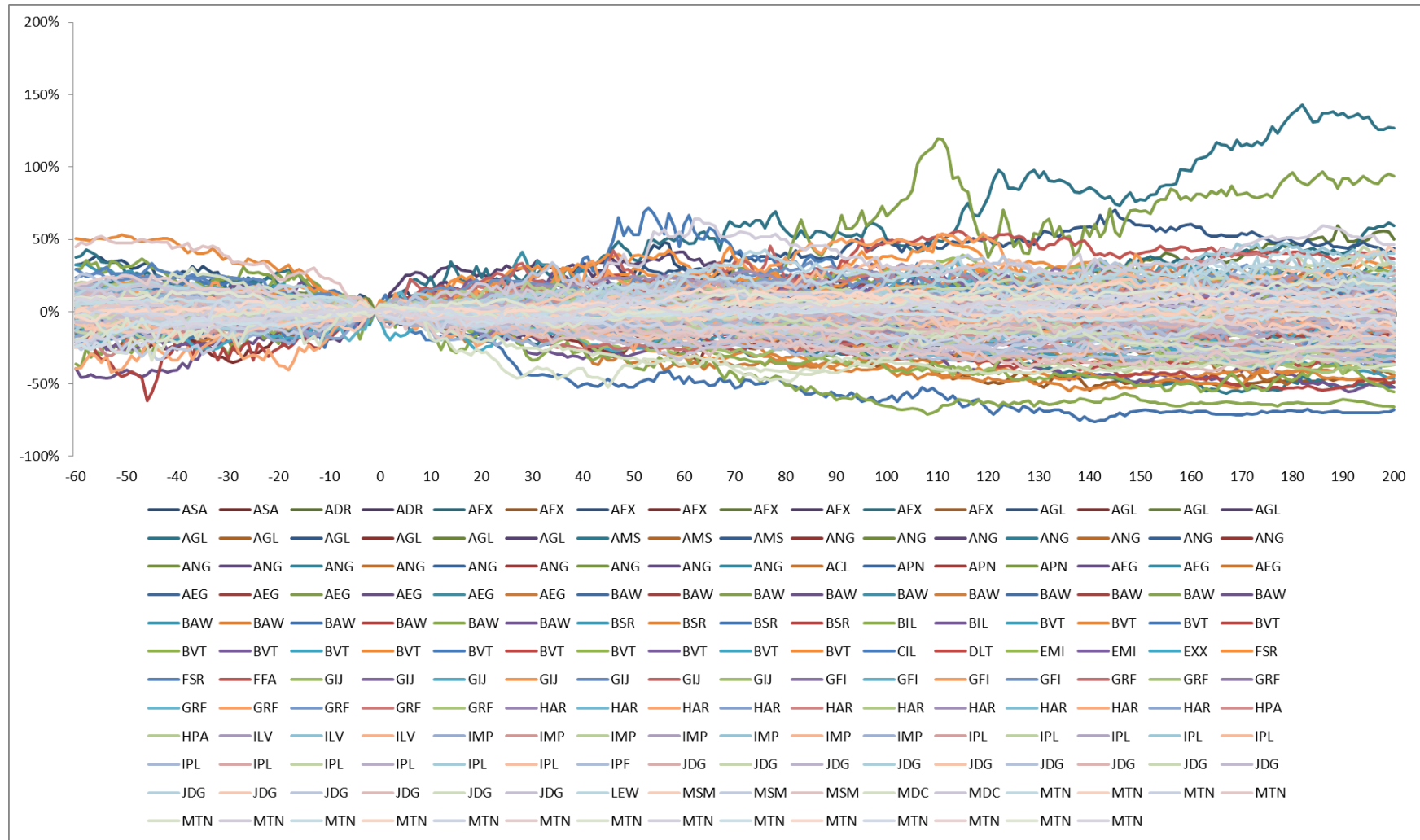
Figure 5: Spaghetti graph showing individual observation CAARs [Share MUR to WKF]
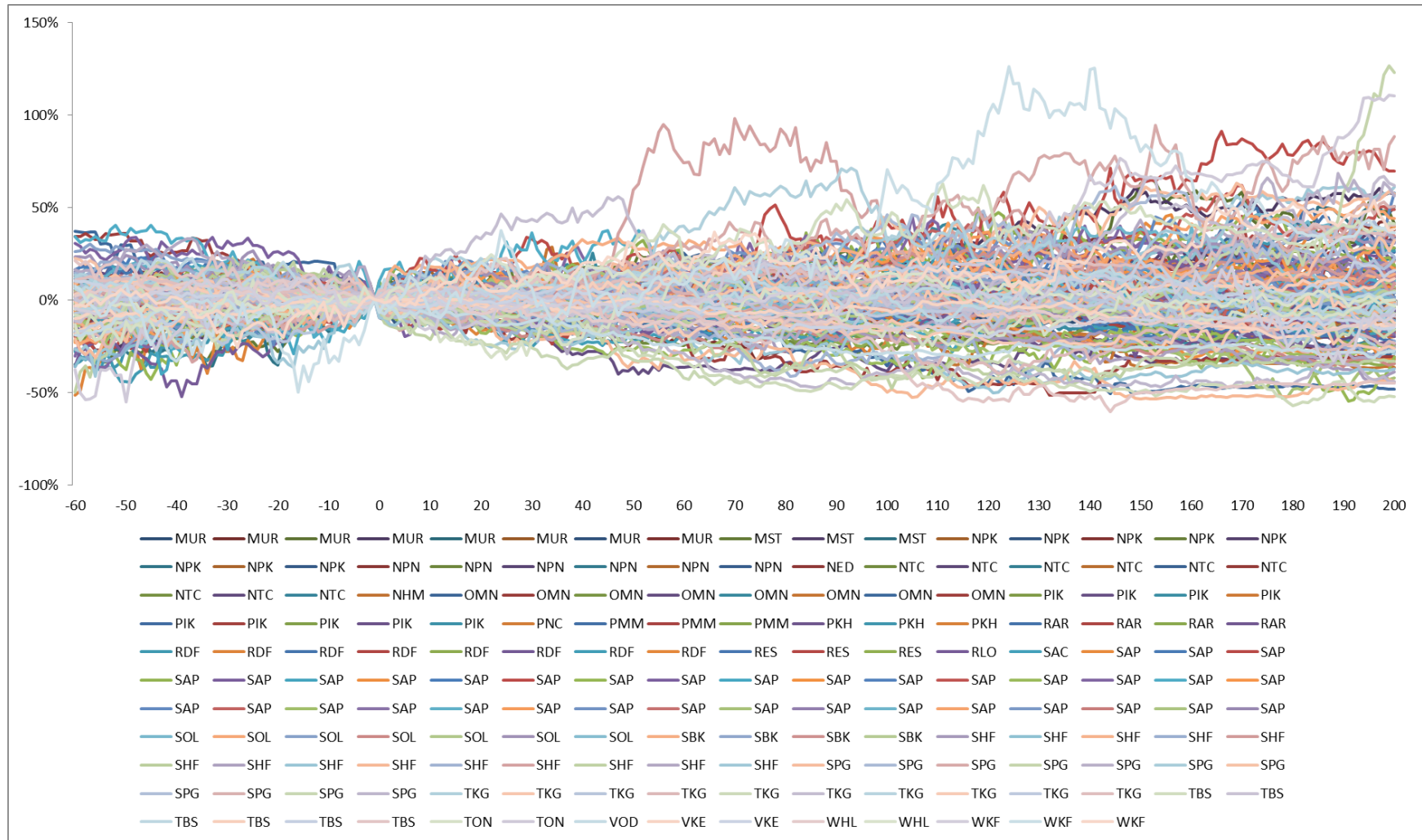
5.4. Share Price Performance

CAARs were generated for the total sample and for each hypothesis thereafter and displayed in Figures 6 to 18. The results were displayed graphically with the CAAR for the relevant (sub) sample of data found on the y-axis and the event period from day t-60 to day t+200 on the x-axis. In each figure the actual CAARs are plotted against the Monte Carlo bootstrap in order to test the CAARs for significance at the 1 per cent level and is shown as a 99th percentile upper limit and a 1st percentile lower limit.

There appears to be a negative bias in the total sample as shown in the downward slope of Figure 6 attributed mainly (54 per cent) to the large sample (n=198) of 'Affirm' ratings which also have a downward slope. Whilst the majority of the data show insignificant results, there does appear to be a significant, albeit brief, market reaction before the event date between [-27,-25], and numerous small runs after the event date, the longest of which lasted 10-days at [+93,+103] and again at [+118,+128].

Figure 6: CAARs for full sample (n= 364) of credit rating announcements
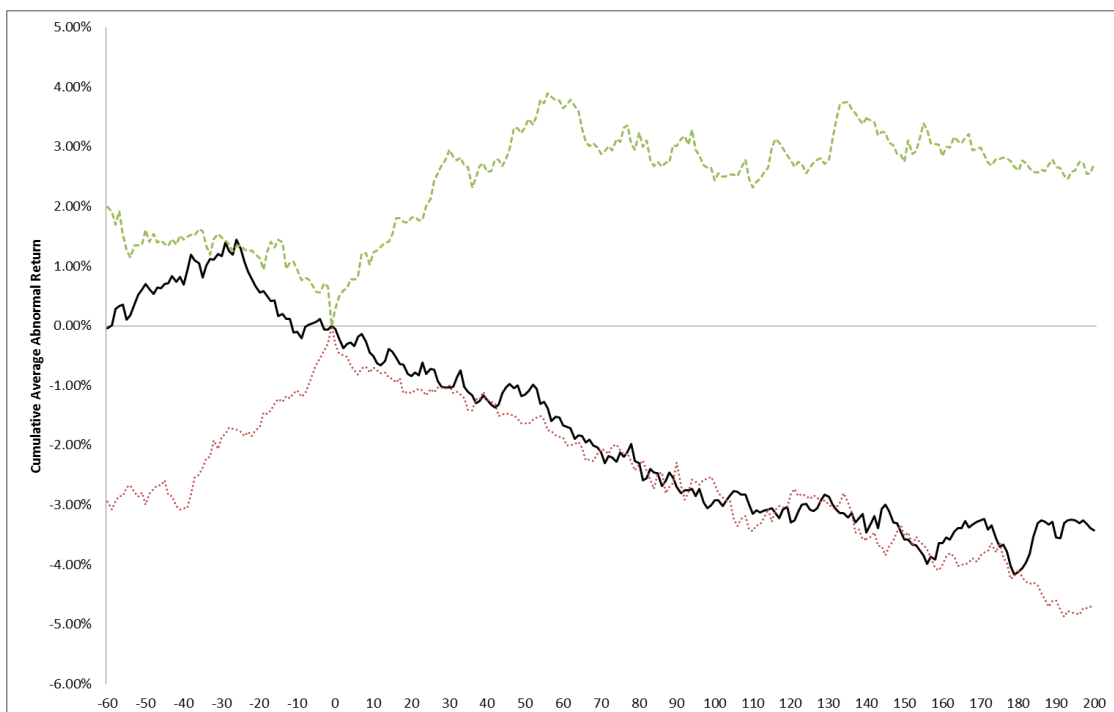
5.4.1. Hypothesis 1

In assessing whether a rating action is associated with abnormal share returns around the credit rating announcement date, share price CAARs for each of the five rating actions (Downgrade; Upgrade; Assign; Affirm; and Withdraw) were tested for significance at the 1 per cent level.

The market appears to have anticipated the downgrades before the announcements were made, and as early as day t-26. It continued to price in the news for a prolonged period after the announcement date after which a levelling off followed from day t+153. Unexpectedly, almost all of the CAARs in the event window are significant.

Before a downgrade, there is a significant period of abnormal returns as seen in window [-60,-11]. After a credit rating downgrade is announced, there appears to be a continuation of the earlier significant (negative) market reaction to this news extending to day t+38. A mild recovery followed until day t+45 with a significant burst of negative abnormal returns ensuing for the period [+45,+66]. Figure 7 illustrates these details.

Figure 8 displays the market reaction to credit rating upgrades. There is evidence of market anticipation to an upgrade as early as 35 days before the upgrade was publicly announced. A slight 'recovery' followed from days [-8,+22] giving rise to a second and third wave of (positive) 10- to 15-day runs at day t+18 and t+89 respectively. A brief period of significance occurred at window [+31,+34] and again at [+95,+116]. CAARs of approximately 1.5 per cent were achieved for the [+50,+100] window and dropped down to -1 per cent post day t+150. However, caution should be exercised when deriving any findings from this sub-sample due to the sample size (n=16), and a larger sample should be tested in the future to corroborate these findings.

Figure 7: Cumulative Average Abnormal Returns for downgrade sample (n= 68) of credit rating announcements
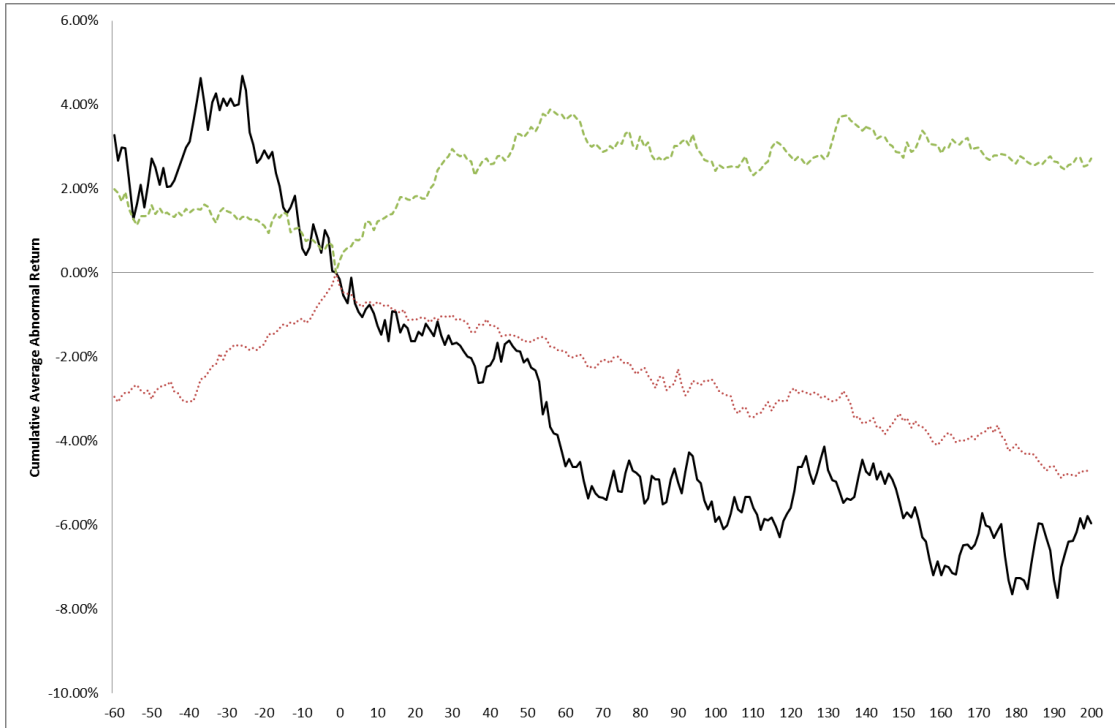
Figure 8: Cumulative Average Abnormal Returns for upgrade sample (n= 16) of credit rating announcements

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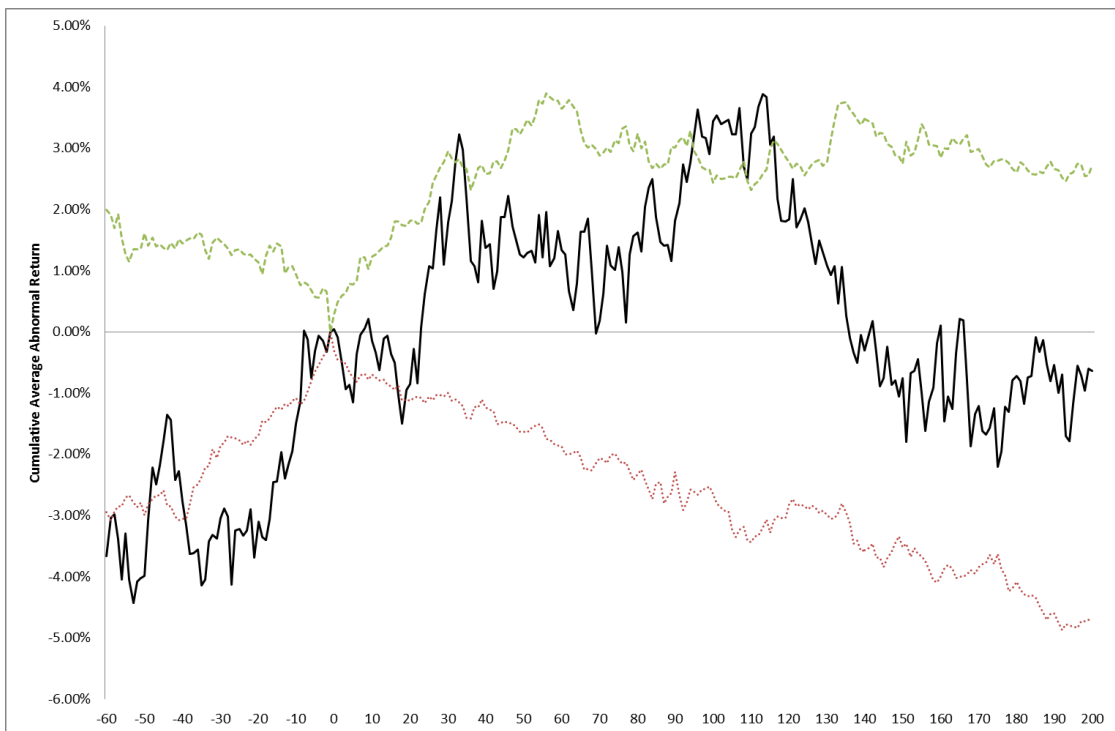
The market appears to not anticipate an announcement of initial ratings being assigned to companies as shown in Figure 9. However, immediately after the announcement is made, a positive run is observed for a 10-day period. Thereafter it is only after day t+65 that a negative 30-day run is observed. A recovery is evident at around day t+164 and continued for the rest of the event window.

Figure 10 shows an initial negative market reaction to the anticipation of an 'Affirm' rating starting at day t-29. After a brief period of recovery between [-20,+9], another prolonged negative 40-day run was observed. The remainder of the event window illustrates the 'Assign' ratings straddling the lower limit. This reaction was unexpected as an 'Affirm' rating theoretically adds no additional news to the market. In addition, 69 per cent of these Affirm ratings were announced together with a stable or positive outlook.

Figure 11 shows the CAARs as a result of a 'Withdraw' announcement made by a CRA. Due to the small sample size (n=8), no meaningful analysis can be performed.

Figure 9: Cumulative Average Abnormal Returns for assign sample (n= 74) of credit rating announcements

Figure 10: Cumulative Average Abnormal Returns for affirm sample (n= 198) of credit rating announcements

Figure 11: Cumulative Average Abnormal Returns for withdraw sample (n= 8) of credit rating announcements

5.4.2. Hypothesis 2

In assessing whether the brand of CRAs is a factor in explaining the quantum of the CAARs around the announcement date of a credit rating from any of the four CRAs, CAARs for each of the four CRAs (Moody's; Standard & Poor's; Fitch; and Global Credit Rating Co.) were tested for significance at the 1 per cent level.

The two largest CRAs (Moody's and Standard & Poor's) exhibit similar downward trends in the data post-announcement as shown in Figures 12 and 13. There appears to be no anticipation of an announcement for Moody's, however Standard & Poor's exhibited some pre-announcement anticipation of rating at day t-26. Both negative trends were expected as both CRAs issued majority 'Affirm' and 'Downgrade' ratings that also exhibited a downward trend line of negative CAARs. Recovery of CAARs for both CRAs is not evident within the event window.

Significant (negative) runs are observed for the period [0,+14]; [+26,+33]; [+69,+102] and [+149,+178] for Moody's interspersed with significant (positive) runs for the periods [+14,+26]; [+32,+42]; [+109,+144] and [+178,+193]. A significant (negative) run is observed pre-announcement for the period [-26,-13] for Standard & Poor's; at announcement [-2,+5]; and post announcement [+36,+66] and again at [+168,+179]. There appears to be an anticipated rating from Fitch in the market, with signs of significant (negative) abnormal returns from day t-29. A period of recovery ensues for approximately 80 days followed by a 120-day run of positive abnormal returns. These details are illustrated in Figure 14.

Figure 15 shows the market does not anticipate a rating from Global Credit Ratings Co. pre-announcement. However, approximately 14 days after an announcement, negative abnormal returns are observed until the end of the event window.

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Figure 12: Cumulative Average Abnormal Returns for Moody's sample (n=51) of credit rating announcements

Figure 13: Cumulative Average Abnormal Returns for Standard & Poor's sample (n=38) of credit rating announcements

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Figure 14: Cumulative Average Abnormal Returns for Fitch sample (n=115) of credit rating announcements
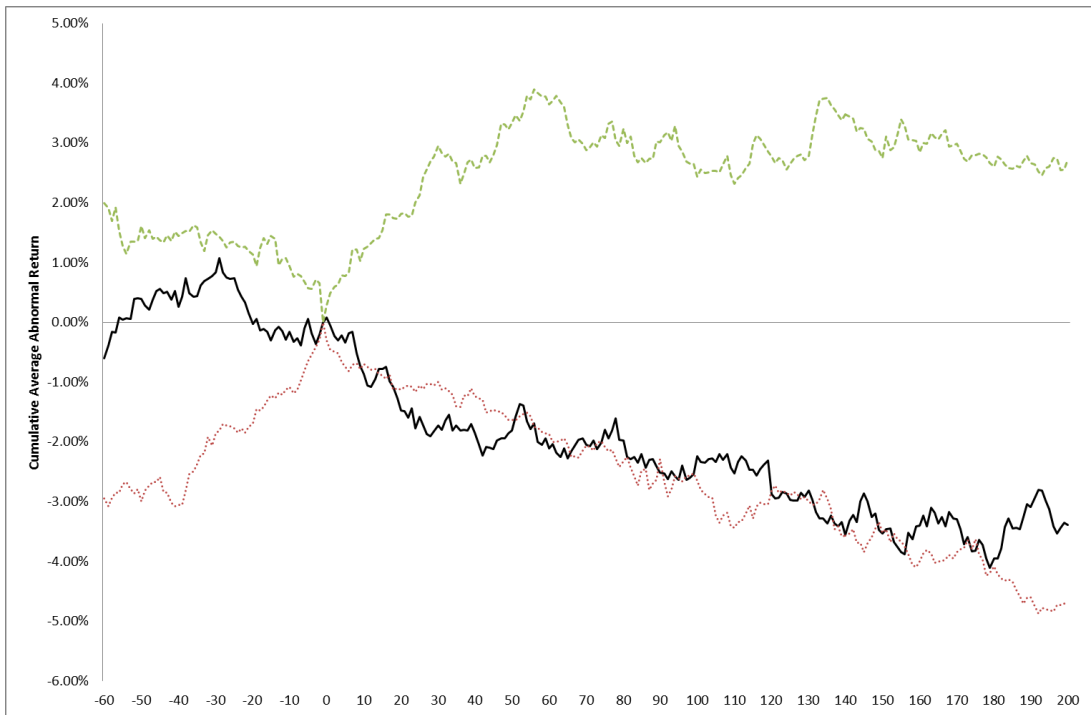

Figure 15: Cumulative Average Abnormal Returns for Global Credit Ratings Co. sample (n=160) of credit rating announcements
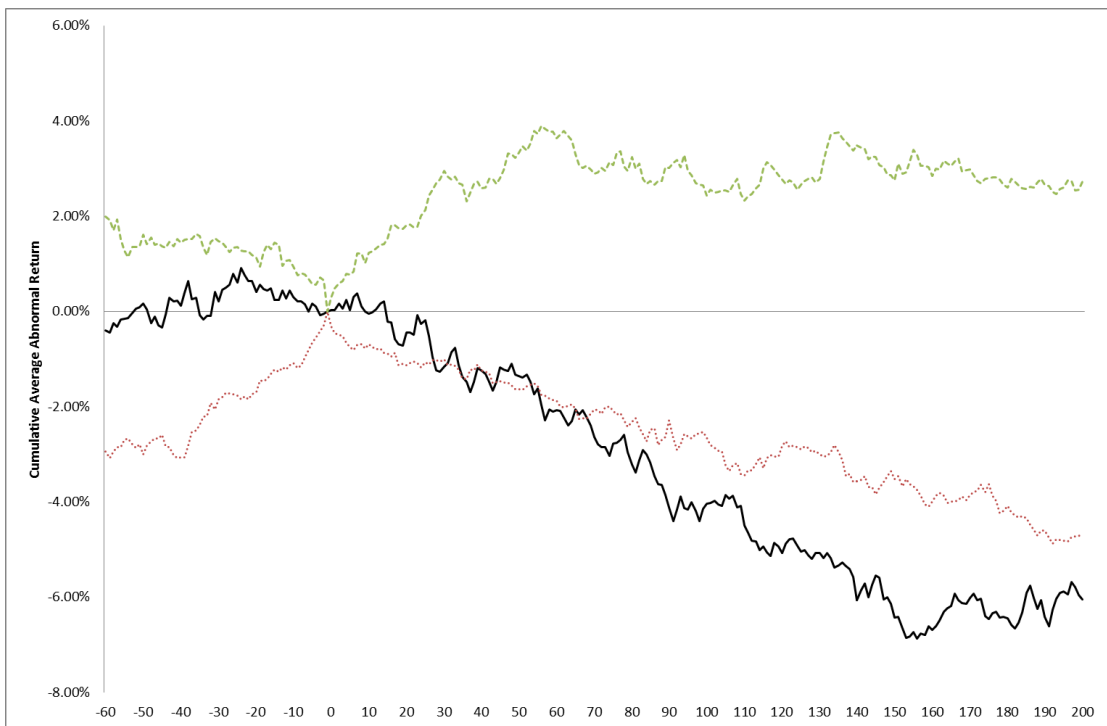
5.4.3. Hypothesis 3

In assessing whether company size is a factor in explaining the quantum of CAARs around the announcement date of a credit rating announcement, CAARs for each of the market capitalisation clusters (large-cap; mid-cap; and small-cap) were tested for significance at the 1 per cent level.

Large-cap firms, as shown in Figure 16, tend to anticipate some of the news pre-announcement and negative CAARs occur as early as day t-27 and continue to day t-12. A further period of negative CAARs continues post-announcement from day t+6. This negative run becomes significant on day t+10. A recovery follows until day t+35, after which a steady pattern of negative abnormal returns continue.

Figure 17 illustrates that mid-cap firms also tend to anticipate news before the announcement date from a CRA, and negative abnormal returns are observed from approximately 26 days before an announcement is made and extends to approximately 40 days after. A positive run is observed from day t+120, although not significant.

Small-cap firms (see Figure 18) do not exhibit any significant abnormal returns before an announcement is made, with only a slight downward tick from day t-24. However after a delayed 14 day period, a prolonged (negative) run is observed until the end of the event window. These negative abnormal returns become significant from day t+56.
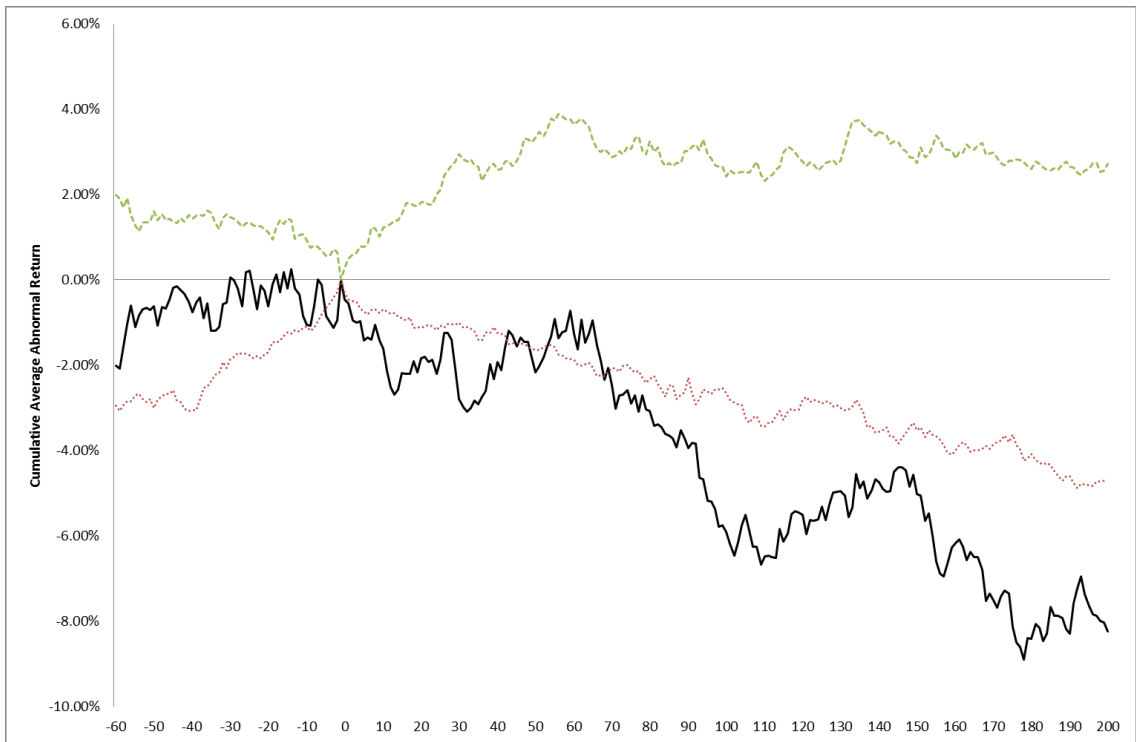
50

Figure 16: Cumulative Average Abnormal Returns for large-cap sample (n=121) of credit rating announcements

Figure 17: Cumulative Average Abnormal Returns for mid-cap sample (n=121) of credit rating announcements
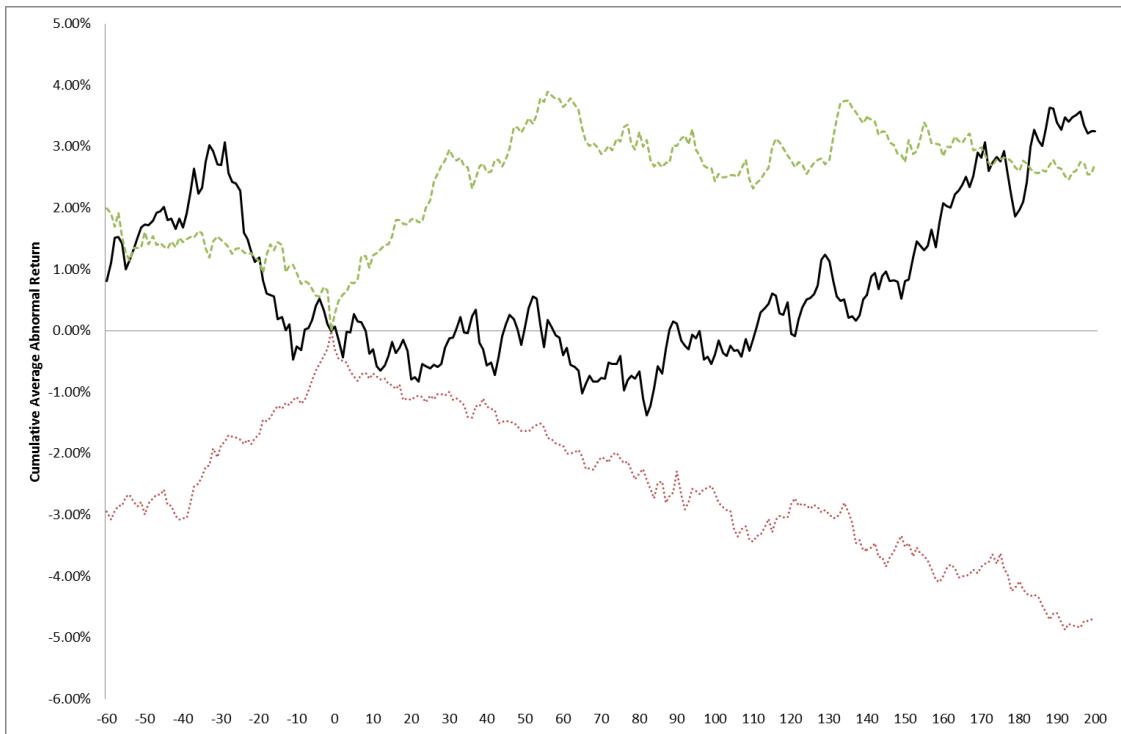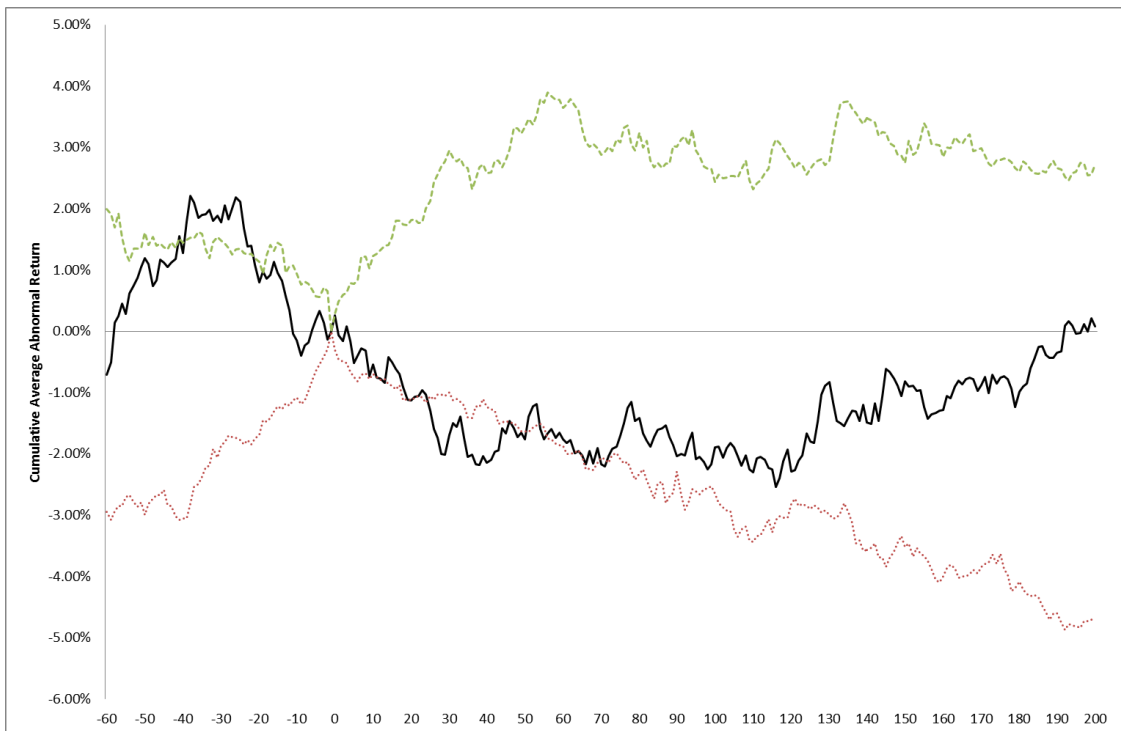
Figure 18: Cumulative Average Abnormal Returns for small-cap sample (n=122) of credit rating announcements
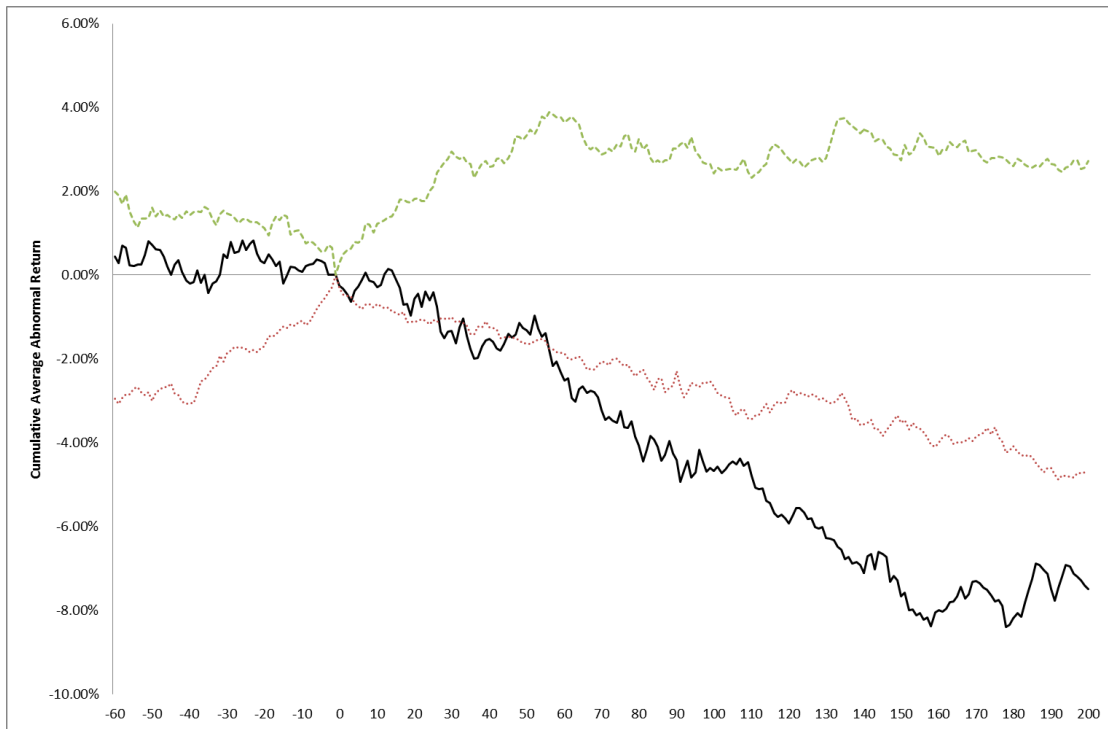
A deeper analysis of the market capitalisation clusters reveals there is a bias from Moody's and Standard & Poor's to rate large-cap firms, whilst the bias for Fitch exists in the mid-cap cluster, with Global Credit Rating Co. issuing most of its ratings for small-cap firms. Table 8 shows the distribution of firm sizes within each CRA.

Table 8: Distribution of market capitalisation clusters by CRA

	Large-cap	Mid-cap	Small-cap	Total
Moody's	26	19	6	51
Standard & Poor's	26	10	2	38
Fitch	44	49	22	115
Global Credit Rating Co.	25	43	92	160
Total	121	121	122	364

5.4.4. Conclusion

A summary of all 10-day or longer CAAR runs for all sub-samples is displayed in Table 9, with reference to the significance of the run and the direction (positive or negative) of the abnormal returns. Significance is shown at the 1 per cent level.

Table 9: Summary of 10-day or longer CAAR runs per sub-sample

Sub-sample	Run days	Run window	CAARs
Downgrade	10	[-47,-37] ***	positive
(n = 68)	14	[-26,-12] ***	negative
	11	[+26,+37] ***	negative
	15	[+45,+60] ***	negative
	12	[+146,+148] ***	negative
Upgrade	11	[+18,+33]	positive
(n = 16)	17	[+121,+138]	negative
Assign	10	[0,+10]	positive
(n = 74)	15	[+65,+80]	negative
	12	[+121,+133] ***	positive
Affirm	14	[-29,-15]	negative
(n = 198)	10	[+17,+27] ***	negative
	10	[+42,+52] **	positive
	12	[+180,+192]	positive
Withdraw	27	[+98,+125]	positive
(n = 8)	22	[+147,+169]	positive
Moody's	13	[0,+13] ***	negative
(n = 51)	10	[+31,+42] ***	positive
	14	[+88,+102] ***	negative

Standard & Poor's	10	[+49,+59] ***	negative
(n = 38)	11	[+168,+179] ***	negative
Fitch	18	[-29,-11] ***	negative
(n = 115)	10	[+158,+168]	positive
GCR	10	[-60,-50]	positive
(n = 160)	18	[+122,+140] ***	negative
	13	[+153,+166] ***	positive
Large-cap	14	[-51,-37]	positive
(n = 121)	13	[-26,-13]	negative
	12	[+70,+82]	negative
	10	[+171,+181]	negative
Mid-cap	10	[-60,-50]	positive
(n = 121)	14	[+14,+28] ***	negative
	10	[+120,+130]	positive
	13	[+179,+182]	positive
Small-cap	10	[+52,+62] ***	negative
(n = 122)	12	[+108,+120] ***	negative
	17	[+123,+140] ***	negative
	12	[+146,+158] ***	negative
	12	[+158,+170] ***	positive

*** Significant at the 1% level

** Significant at the 5% level

The following notable observations were made from Table 9:

- All 10-day CAAR runs for the Downgrade sub-sample exhibit reasonably significant (negative) abnormal returns post the announcement date of a credit rating;

- Upgrades, in contrast, exhibit no significant results;

- Moody's and Standard & Poor's both exhibit significant (mostly negative) abnormal returns from the 10-day CAARs observed post-announcement; and

- Of all market capitalisation clusters, small-cap firms exhibit the most significant (mostly negative) 10-day runs after a rating announcement has been made.

However given the abnormal returns view in Table 9, it may be difficult to observe any significant long-run observations of abnormal returns. To this end, the magnitude of CAARs for long-run windows is shown in Table 11.

Finally, an observation was also made regarding the frequency of the sub-samples that displayed a potential 'anticipation' to a credit rating announcement before the announcement date. To provide, a more concise view on all sub-samples that demonstrated a pre-announcement market reaction to the event, Table 10 shows the sub-sample concerned with the earliest date of a potential anticipation.

Table 10: Sub-samples indicating pre-announcement market reaction

Sub-sample	Earliest date indicating anticipation of a credit rating announcement
Downgrade	$t-26$
Upgrade	$t-35$
Assign	$t-29$
Affirm	$t-29$
Moody's	-
Standard & Poor's	$t-26$
Fitch	$t-29$
Global Credit Rating Co.	$t-24$
Large-cap	$t-27$
Mid-cap	$t-26$
Small-cap	$t-24$

Table 11: Observed CAARs (%) for long-run event windows

Sub-sample	Sample size	[-60,+200]	[-60,0]	[0,+50]	[0,+100]	[0,+200]	[+50,+100]	[+100,+200]
Downgrade	68	-9.25***	3.28***	-2.05***	-5.92***	-5.97***	-3.87***	-0.05***
Upgrade	16	3.07	-3.67***	1.22	3.44	-0.60	2.22	-4.04
Assign	74	-3.63	-0.59	0.80	-4.21***	-4.22	-5.01***	-0.01
Affirm	198	-3.01	-0.38	-1.81***	-2.24	-3.39	4.05	-1.15
Withdraw	8	25.39***	-3.08	0.16	6.44***	22.31***	6.28***	15.87***
Moody's	51	-6.16***	-2.08	-2.17	-5.91***	-8.24***	-3.74***	-2.33***
Standard & Poor's	38	-6.42***	1.30	-2.57***	-1.66	-5.12***	0.91	-3.46***
Fitch	115	2.44***	0.81	0.05	-0.39	3.25***	-0.44	3.64***
Global Credit Rating Co.	160	-6.39***	0.44	-1.36	-4.03***	-5.95***	-2.67***	-1.92***
Large-cap	121	-2.92	0.23	-0.39	-2.16	-2.69	-1.77	-0.53
Mid-cap	121	0.58	-0.50	-1.64	-1.90	0.08	-0.26	1.98
Small-cap	122	-7.78***	0.29	-1.31	-4.67***	-7.49***	-3.36***	-2.82***

*** Significant at the 1% level

6. DISCUSSION OF RESULTS

The primary objective of this chapter is to interpret the results as found in the previous chapter with reference to the literature examined in chapter two and the hypotheses presented in chapter three. Consequently, the discussion of results concludes with answers to the research hypotheses established in chapter three. Table 12 provides a summary of the hypotheses to be discussed.

Table 12: Summary of Hypotheses (null)

$H1_0$:	Hypothesis 1 stated (null): Credit rating actions do not cause abnormal share returns on the JSE around the credit rating announcement date
$H2_0$:	Hypothesis 2 stated (null): Credit rating agencies do not cause abnormal share returns on the JSE around the credit rating announcement date
$H3_0$:	Hypothesis 3 stated (null): The firm size of the rated entity does not cause abnormal share returns on the JSE around the credit rating announcement date

6.1. Hypothesis 1

This study examines 50-day, 100-day and 200-day abnormal share returns following credit rating changes and finds negative CAARs for downgrades for all of the observed periods in the magnitude of -2 to -6 per cent, reaching a peak at day t+191 as illustrated in Figure 7. The highest (negative) abnormal returns observed for downgrades occurred in the [+50,+100] window with CAARs in the magnitude of -6 per cent. In the long-run and in general, these findings show that the JSE exhibits significantly negative CAARs for credit rating downgrades which is consistent with most similar studies (Dichev & Piotroski, 2001; Griffin & Sanvicente, 1982; Steiner & Heinke, 2001; Barron et al., 1997; Choy et al., 2006; Freitas & Minardi, 2013).

In contrast, upgrades tend to exhibit positive CAARs before day t+100 with a subsequent correction post day t+100 as shown in Figure 8. Overall, this study finds no reliable or significant abnormal returns for shares with upgrades in all of the observed

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periods post thee announcement date, as illustrated in Table 10. These findings are consistent with the findings of most similar studies performed to date (Griffin & Sanvicente, 1982; Barron et al., 1997; Hand et al., 1992; Hite & Warga, 1997; Steiner & Heinke, 2001; Choy et al, 2006; Freitas & Minardi, 2013).

A possible explanation by Dichev and Piotroski (2001) attributes the long-run negative abnormal returns to investor behavioural and information-processing biases. They suggest that optimism may result in more erroneous conclusions when applied to negative situations, which are in turn followed by more extreme subsequent adjustments to share prices. This explanation appears plausible as behavioural biases are also present in the works of Bernard and Thomas (1989) in which they find that post-announcement drift is more pronounced for negative earnings surprises. Similarly, Michaely, Thaler, and Womack (1995) find more extreme abnormal returns following dividend omissions and cuts, as opposed to dividend increases and initiations.

Assign ratings displayed a negative downward bias as shown in Figure 9 despite the fact that investment-grade ratings were assigned to companies with mostly stable and positive outlooks. These results however do not appear to be meaningfully or reliably significant in the long-run. Barron et al. (1997) suggest that benefit to a firm that has a newly assigned long-term rating do not appear in the form of "significant reductions in the cost of capital" (Barron et al., 1997, p. 508).

'Affirm' ratings in theory do not provide additional news to the market as they are confirming a previous stated position of a company's creditworthiness. Whilst the data shows that CAARs have a negative bias to Affirm ratings, the results are however not reliably significantly different from zero at the 1 per cent level as illustrated in Figure 10.

Withdrawals of ratings were found to exhibit significantly positive abnormal returns, especially within the [+50,+200] window of Table 10. Caution must be taken when drawing meaningful results from a small sample size and it is recommended that this result is validated with a larger sample in the future.

In conclusion, credit rating actions add new information to the JSE and thus do cause abnormal returns around the credit rating announcement date. It may therefore be concluded that the null hypothesis is rejected in favour of the following alternative hypothesis:

- **H1_{a1}**: Credit rating downgrades cause (significant) negative abnormal share returns on the JSE around the credit rating announcement date

- **H1_{a2}**: Credit rating upgrades cause (insignificant) positive abnormal share returns on the JSE around the credit rating announcement date

6.2. Hypothesis 2

When the sample is split by credit rating agency, in the long-run i.e. [0,+200], all four CRAs exhibit significant returns as shown in Table 10. Figures 12, 13 and 15 illustrate that Moody's, Standard & Poor's and Global Credit Ratings Co. display negative abnormal returns in the magnitude of -6 per cent whilst those of Fitch (Figure 14) are positive and in the magnitude of 2.5 per cent. The findings for Standard & Poor's and Moody's are in line with the findings of Norden and Weber (2004) in which they find the largest negative CAARs are attribute to these two CRAs (when compared with Fitch).

In conclusion, credit rating agencies add new information to the JSE and thus cause abnormal returns around the credit rating announcement date. It may therefore be concluded that the null hypothesis is rejected in favour of the following alternative hypothesis:

- **H2_{a1}**: Moody's causes negative abnormal returns on the JSE around the credit rating announcement date

- **H2_{a2}**: Standard & Poor's causes negative abnormal share returns on the JSE around the credit rating announcement date

- **H2_{a3:}** Fitch causes (positive) abnormal share returns on the JSE around the credit rating announcement date

- **H2$_{a4}$:** Global Credit Ratings Co. causes (negative) abnormal share returns on the JSE around the credit rating announcement date

6.3.   Hypothesis 3

A repeat of the study when split by firm size indicates that large- and mid-cap firms do not have any significant impact on abnormal returns as illustrated in Figures 16 and 17 whereas small-cap firms (Figure 18) have a significant negative impact on the JSE producing CAARs of -7.5 per cent. This finding supports that of Bernard and Thomas (1989) and Fama (1998) in which they find that smaller, more underfollowed firms displayed the largest CAARs and were more prone to informational inefficiencies.

In conclusion, firm size is a factor in explaining abnormal returns on the JSE around the credit rating announcement date. It may therefore be concluded that the null hypothesis is rejected in favour of the following alternative hypothesis:

- **H3$_{a3}$:** Small-cap firms cause (negative) abnormal share returns on the JSE around the credit rating announcement date

6.4.   Market efficiency of the JSE

In assessing market efficiency on the JSE, the speed and extent of pricing in new information needs to be observed. Before an assessment is performed on the post-announcement share reaction to credit rating announcements, we analyse any pre-announcement reactions and provide explanations for same.

6.4.1. Pre-announcement effects on the JSE

At first glance, it appears that the market either anticipated an announcement or was trading on insider information before the announcements date of a credit rating as shown in Table 11. All sub-samples, with the exception of Moody's, exhibit what

appears to be an anticipation of a rating announcement as early as one month before the event date. In addition, this pre-announcement effect was found to be significant in the case of downgrades.

This phenomenon would only be found in those studies that conducted a long run event study in order to capture the relevant pre-announcement period. One such study has been documented by Hite and Warga (1997) in which they also found a significant announcement effect to downgraded firms in both the announcement month and pre-announcement period. In addition they found that samples that were restricted to only one rating within a six month window show that "markets react reliably as much as six months before an event" (Hite & Warga, 1997, p. 35).

However, to simply deduce that continuous insider trading explains the observed pre-announcement reaction would be improbable as one would have to assume that most CRAs in South Africa would have a few insiders trading on non-public knowledge over a prolonged period of time. This is especially unlikely considering evidence that staff turnover for these CRAs is high (Partnoy, 1999);

A more plausible explanation would be that the market is reacting to some other lead indicator/s of creditworthiness that precedes a credit rating announcement.

- Credit Watch Listings (Gu et al., 2014; Wansley & Clauretie, 1985, Chung et al., 2012) were found to be a timelier alternative to credit rating announcements, although both Norden and Weber (2004) and Gu et al. (2014) found that there may be yet another indicator that precedes even Credit Watch Listings as the stock market not only anticipates rating downgrades, but also the reviews for downgrades.

- Credit Default Swap spread and level (Flannery et al., 2010; Predescu et al., 2004; Zhu, 2006) were also found to be a timelier alternative to credit rating announcements. However some caution must be taken when assuming the CDS market in South Africa will provide earlier indications of a company's creditworthiness. The secondary CDS market is even less liquid than the primary cash markets on the JSE due to a wider breadth of CDS positions (KPMG, 2013a). As a result, market inefficiencies are exacerbated by discrepancies with price to book value and unmet portfolio requirements (Chataika, 2014).

- Cherny (2014) advocates the use of auditors as a superior measure of creditworthiness when compared to CRAs as they have access, through formal mandate, to deeply analyse the internal workings of a firm. As to whether this mechanism is a timelier alternative to credit rating announcements on the JSE, is yet to be investigated but may be a potential factor in explaining pre-announcement drops.

Based on the evidence to date, pre-announcement effects of a credit rating announcement on the JSE can be attributed to one or more lead indicators for creditworthiness. Further research on the JSE is needed to determine if this lead indicator is indeed a Credit Watch Listing or occurs within another indicator.

6.4.2. Speed and extent of processing credit rating announcements on JSE

Downgrades react almost immediately to credit rating announcements however they are not fully factored into the share price immediately. In fact, CAARs are observed to continue their downward drift to the end of the long-run event window.

Moody's data also exhibits an immediate although incomplete share price reaction to credit rating announcements. These abnormal returns remain significant in the long-run, to the end of the event window. Standard & Poor's and Global Credit Ratings Co. also exhibit similar downward and significant negative abnormal returns in the long run. Global Credit Ratings Co. shows abnormal returns up to day t+160. Small-cap firms tend to react briefly (negatively) at date of announcement and show negative abnormal returns up to day t+180.

In conclusion, this research report found the JSE to be reasonably inefficient, in that the earliest impact of credit rating announcements only appear to be fully incorporated in share prices several days (around day t+160) after the CRA made the announcement.

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7. CONCLUSION

Whilst research in the area of the impact of credit rating announcements on common stock returns has been extensively performed internationally with a particular focus on the U.S. stock exchange and that of other developed markets, this research investigates these impacts on emerging markets, and in particular the South African JSE.

As emerging markets experience growth in trades, these exchanges remain characterised by volatility and substantial returns (Lesmond, 2005). In these exciting times, it therefore bodes well for investors to focus their attention and portfolios to emerging markets. It then follows that these investors will require information on the nature and behaviour of these exchanges in order to fully take advantage of the informational content of newsworthy events. Consequently, this research contributes new information around credit rating information content and its impact on the JSE.

7.1. Principal findings

The results of this report show that the JSE is indeed reasonably inefficient when pricing in new information that result from credit rating announcements. The earliest impact of credit rating announcements only appear to be fully incorporated in share prices several days (around day t+160) after the CRA has made the announcement. This deduction is based on three separate pieces of informational content regarding credit rating announcements:

- First, in the long-run credit rating downgrades (upgrades) have a significant negative (insignificant positive) impact on abnormal returns for up to 200 days after the announcement date;

- Second, Moody's, Standard & Poor's and Global Credit Ratings Co. all exhibit significant (negative) abnormal returns as a result of credit rating announcements, whilst that of Fitch is positive in the long-run;

- Finally, smaller firms are found to generate significant negative abnormal returns within the context of credit rating announcements in the long run.

It was also found that the JSE anticipates rating announcements and this suggests that another or multiple other lead indicators for creditworthiness may exist.

7.2.   Implications for practitioners

Investment Analysts

Investment analysts continuously look for events in the market that hold new information and have the ability to generate abnormal returns attributed to the share price responsiveness to such information (Jensen, 1967). The findings of this research advise investors to pick stocks of small market-cap companies with low or lowered creditworthiness (as indicated by a downgrade in credit rating) with extreme caution, as these stocks are likely to underperform the market in the long run.

Credit Risk Managers

Credit Risk Managers attempt to mitigate credit risk by improving their ability to detect early warning systems. Typically, ratings and model-based assessments are used as early warning systems, however if the JSEs prices anticipate these credit rating announcements, then credit risk managers can take action earlier against unfavourable changes of credit quality (Norden & Weber, 2004).

7.3.   Limitations of the research

In addition to the research limitations that have been outlined in section 4.6 of chapter four, the following additional limitations have been identified:

- As is a limitation of all long-run studies, confounding effects are likely to affect the sample results and thus undermine the long-run abnormal returns and findings of the research;

- Further robustness to gauge the differences between CRAs can be ascertained

by conducting either a paired t-test or ANOVA testing.

7.4. Suggestions for future research

This study has focused on the overall credit rating impact on share performance on the JSE. Given the significance and permanence of the impact of a downgrade to abnormal returns in the long-run, future research should focus on analysing the deeper informational content of downgrades. Three potential future research studies emerge regarding downgrades on the JSE:

Reasons for downgrades

Future research should explore whether downgrades as a result of firms' leverage and downgrades as a result of deteriorating financial prospects (Goh & Ederington, 1993) hold significantly different informational value to investors on the JSE and thus have significantly different impacts on share price performance.

Investment versus Non-Investment grade status

Future research should also extensively measure the magnitude of the impact on share performance on the JSE as a result of a downgrade to either investment grade status or non-investment grade status. Studies in other markets have found that the magnitude of downgrades increase substantially when a sample shifts from investment-grade to non-investment-grade.

Contagion versus Competition effects

This study looked at all sectors on the JSE. Jorion and Zhang (2010) found that when the downgraded firms started from an investment-grade rating, the industry effect is negative (contagion) versus a positive effect (competition) for speculative-grade firm downgrades. Future studies should focus on industry competitors within specific industries and how they behave or benefit in relation to a downgrade of another industry player, with specific focus on the JSE.

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7.5. Conclusion

This research set out to evaluate the speed and extent to which credit rating announcements of listed companies add new information to the JSE and thus ultimately test market efficiency of this exchange. Specifically, it evaluated whether credit rating announcements for companies listed on the JSE, in the nine year period from 1 January 2005 to 31 December 2013, significantly impact the share price performance of the rated company.

An event study methodology was adopted to identify and quantify the existence the long-run cumulative average abnormal returns as a result of credit rating announcements. To test these results for significance, a Monte Carlo bootstrap simulation was performed.

What emerged suggested that the JSE is inefficient when factoring in credit rating announcements into the share price, and downgrades (upgrades) have a significantly negative (insignificantly positive) reaction on share price. In addition, all rating agencies display significantly negative long-run abnormal returns with the exception of Fitch (which is significant and positive); and small-cap firms exhibit the largest negative abnormal returns when compared with all other firms sizes.

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APPENDIX A

Table 1

Statements cited within Terms of Use on Credit Rating Agency websites

Credit Rating Agency	Cited as per Terms of Use of CRA website
Standard & Poor's Rating Services (2014)	Users of the information provided through this Web Site should not rely on any of it in making any investment decision. Standard & Poor's opinions and analyses do not address the suitability of any security.
Moody's Investor Services (2014)	You expressly agree that (a) the credit ratings and other opinions provided via the Site are, and will be construed solely as, statements of opinion of the relative future credit risk (as defined below) of entities, credit commitments, or debt or debt-like securities and not statements of current or historical fact as to credit worthiness, investment or financial advice, recommendations regarding credit decisions or decisions to purchase, hold or sell any securities, endorsements of the accuracy of any of the data or conclusions, or attempts to independently assess or vouch for the financial condition of any company.
Fitch Ratings Inc. (2015)	In issuing and/or maintaining a rating, Fitch is not making any recommendation or suggestion, directly or indirectly to you, or any other person, to buy, sell, make or hold any investment, loan or security or to undertake any investment strategy with respect to any investment, loan or security of any issuer.

APPENDIX B

Ethical Clearance Letter

**Gordon Institute
of Business Science**
University of Pretoria

Dear Miss Pearl Venkatraman

Protocol Number: Temp2015-01155

Title: **The Share price reaction to Credit Rating Announcements on the JSE**

Please be advised that your application for Ethical Clearance has been APPROVED.

You are therefore allowed to continue collecting your data.

We wish you everything of the best for the rest of the project.

Kind Regards,

GIBS Ethics Administrator

APPENDIX C

Turnitin Report

Turnitin Originality Report
2 by Pearl Venkatraman
From Test your originality (GIBS Information Center)

- Processed on 04-Nov-2015 21:20 SAST
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Jiang, John (Xuefeng), Mary Harris Stanford, and Yuan Xie. "Does it matter who pays for bond ratings? Historical evidence", Journal of Financial Economics, 2012.

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