

**THE IMPACT OF EARNINGS ANNOUNCEMENTS ON SHARE PRICES OF  
MINING COMPANIES LISTED ON THE JOHANNESBURG STOCK EXCHANGE**

By

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### DECLARATION

I **Phomolo Maraisane**, student number: **55752845** declare that; **The impact of earnings announcements on share prices of mining companies listed on the Johannesburg stock exchange** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.



14 December 2016

**Signed**

**Date**

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### **Dedication**

*I would like to dedicate this work to my late uncle Mr Tseliso Maraisane who always encouraged me to go an extra mile; and only to pass on (07/03/2017) as I completed my journey.*

***“MAY HIS SOUL REST IN PEACE”***

## **ABSTRACT**

The study examined the impact of earnings announcements on the share price of selected mining companies using the most recent data from the Johannesburg Stock Exchange. This study covered a period from 1 January 2011; to 31 December 2015. Using the classical event study methodology, the speed of reaction of the market to annual earnings information releases for a sample of 27 companies listed on the exchange is tested. Over the sample period, the Abnormal Returns (AR), Average Abnormal Returns (AAR) and Cumulative Average Abnormal Returns (CAAR) were calculated. The AR, AAR and CAAR show positive results obtained during the earnings announcement period. The returns yielded from these results are significantly different from zero.

**Keywords:** Efficient market hypothesis; earnings announcements; abnormal returns; event study; share price; Johannesburg stock exchange; mining companies.

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# Chapter 1

## Study overview

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### 1.0 Introduction

This chapter focuses on the introduction of the research topic and the background to the South African mining industry as well as the Johannesburg Securities Exchange (JSE). The stock exchange market reacts in different forms and directions to the announcements of earnings news. Earnings refers to the profit that a company generates during a given time period. This figure is reported in the financial statements half-yearly and annually. According to Rono (2013), earnings are an important yardstick of a company's potential for growth, stock price appreciation and future dividend payouts.

The research on how the market reacts to new information releases has been one of the central themes in finance literature. According to the Efficient Market Hypothesis (EMH), current share prices reflect all available information about the value of a firm, and trading based on this information should not be profitable (Fama, 1965). However Random Walk theory states that past movements of the share price cannot be used to predict future movement (Kendall, 1953). This study assesses the impact of earnings announcements on the share price of mining companies listed on the JSE.

The rest of the chapter is presented as follows: Section 1.1 covers the background of this study. Section 1.2 deals with a brief literature review surrounding this topic and section 1.3 elaborates on the problem statement. The purpose of the study, research objectives and the hypothesis statement are covered in sections 1.4, 1.5 and 1.6 respectively. Section 1.7 presents the definition of terms and is followed by the research design and methodology in section 1.8. Section 1.9 covers validity and reliability while ethical considerations are presented in section 1.10. The researcher concludes the chapter by indicating the delimitations and limitations of the study, and finally, presents the summary.

## 1.1 Background

This study focuses on selected mining companies listed on the JSE in South Africa. The South African mining industry is the seventh largest in the world (Chamber of Mines, 2014). The Citibank estimates that in 2010 South Africa had about US\$2.5 trillion of mineral resources base, and the mining industry is set to play an important role in the future of the country (Department of Mineral Resources, 2013). In terms of reserves, the country has been classified as the primary producer of platinum group metals, manganese, chromium and gold. Although the mining industry's contribution to the national Gross Domestic Product (GDP) has fallen from 21% in 1970 to 6% in 2011, it still represents approximately 60% of the country's exports (Sennanye, 2015).

The mining industry in South Africa directly contributed to the establishment of the JSE in the late 19<sup>th</sup> century (Projects IQ, 2015). The JSE is the main stock exchange currently in operation in South Africa. It was founded in 1887 mainly to provide a facility through which investors could trade in shares and other tradable commodities. There are approximately 400 companies listed on the JSE in South Africa. Companies in different industries choose to register on the JSE to enjoy the benefits of listing such as; it is often cheaper to raise equity capital rather than to rely on debt finance (JSE, 2015).

During 2012, the South African mining sector accounted for 24,7% (R1,8 trillion) of the JSE all-share index. Moreover, the industry managed to spend 80% of the R488 billion expenditure within South African borders (Department of Mineral Resources, 2013). The mining sector is the significant contributor to the South African economy. For instance, the Chamber of Mines of South Africa (2013) has indicated that it contributes to employment numbers, export earnings, attracting foreign direct investment, contributions to GDP, measured and sustained transformation of the economy.

This study focuses on the impact of earnings announcement on the share prices of selected mining companies listed on the JSE. Public companies are expected to announce their financial reports twice per year (interim and final results) as a requirement from JSE (JSE, 2015). The announcements of these earnings could have an impact on the expectations of investors about their investments in terms of the share prices. During the earnings announcement period (before, on the day, or shortly after the announcement), it can happen that the share price of a JSE listed company may

show some reaction.

Accounting earnings are widely used in corporate practice. This is because of the general belief that they are useful internal measures of the performance of a company and indicators of the change in the common equity value (Cupic, Todorovic & Ilic, 2013). Earnings figures are published regularly and used by investors to make rational decisions, predict future cash flows and deal with investment risks (JSE, 2015). On the other hand, share prices and share returns are important short-term external (market) measures of the company's performance for the investor.

It is the researcher's assumption that when the share price trades higher, investors may invest more in that company and similarly when the share price trades lower there might be less investment. However, investors are keeping a close observation each time the company's earnings are announced because there are other factors to take into consideration for example, an expectation of a growth in the share or a change in the board structure. This is because decisions will have to be made regarding future investments with the company.

Afego (2013) further posits from the empirical literature that share price markets react to information disclosure such as dividend announcements, share splits, macro-economic policy changes and merger announcements. Based on the statement above, it can also be assumed that if the earnings announcement shows a negative result, the investor might have to rethink their investment structure. The following section will focus on the literature surrounding the capital markets.

## **1.2 Literature review**

The literature review was conducted by making use of books, as well as journal articles. Google scholar and the Unisa library were used as the main sources to search for relevant literature.

### **1.2.1 Efficient market hypothesis**

Studies conducted in the late 1960s have revealed that Efficient Market Hypothesis (EMH) was largely tested in the United States of America (USA), the United Kingdom

(UK) and then the rest of the world (Ball & Brown, 1968; Beaver, 1968; Fama, Fisher, Jensen & Roll, 1969). However, in South Africa, this area has not been explored in an exhaustive manner, especially focusing on the listed companies classified according to different industries.

The debate has been whether accounting income numbers have any relationship with the share price (Ball & Brown, 1968; Ball & Brown, 2014). In their seminal work, these researchers found that accounting net income had an impact on the share price. However, after considering their results at the time, and during their follow-up research paper, they concluded that accounting is a viable area for market-based and information-economics reasoning (Ball & Brown, 2014).

Since 1970, the EMH stated that the market price of a share reflects the true price of the share; the market price of a share reflects all available value-relevant information (Malkiel & Fama, 1970). These authors assumed that rational investors could determine the expected future cash flows of a share, its riskiness and the appropriate discount rate to apply to the share's expected cash flows.

In making the EMH more effective, Malkiel and Fama (1970) established three different degrees of efficiency in the market, the *weak-form efficiency*, where the share price reflects its historical prices, which means that future prices cannot be predicted by analysing prices from the past. Furthermore, the *semi strong-form efficiency* would be the case whereby the share price reflects all publicly available information, so no excess return can be earned by trading on this information. However, profit can be made from information that is not publicly available.

The case where the share price reflects all information is described as the *strong-form efficiency* (Malkiel & Fama, 1970). In this situation, investors would not benefit from buying or selling that particular share because the abnormal returns are equal to zero. The following section will further unpack developments in the capital market research.

### **1.2.2 Developments in Capital market**

Early research documented evidence of the relationship between security returns and the release or announcement of company earnings, dividends, issue of new shares and



stock splits (Ball & Brown, 1968; Beaver, 1968; Fama, Fisher, Jensen, and Roll, 1969). Afego (2013) postulates that although this was the development of capital market research, their weakness was their inability to isolate the effects of earnings changes from other information releases.

Rono (2013) studied the share price reaction to earnings announcements of the Nairobi Stock Exchange (NSE) and the JSE. The study revealed that share price changes in both stock exchanges, with respect to earnings announcements, are not random but follow a certain pattern. However, this study will focus on all mining companies listed on the JSE as a specific industry. The study was undertaken based on the following problem statement.

## **1.3 Problem statement**

### **1.3.1 Background to the problem statement**

The mining companies just like any other JSE listed companies in South Africa, are expected to announce earnings figures of their financial results. In most cases, this announcement affects the share prices of these companies. The reaction of a mining company's share price following the earnings announcement is not yet known. This lack of understanding is caused by the lack of studies in this area, particularly in South Africa.

The problem deals with the possible insufficient body of research on the impact of earnings announcements on share prices by mining companies (Wang & King Phet, 2012). Most of the studies conducted about the share price behaviour focused on the listed companies (index) of a particular stock exchange (Ball & Kothari, 1991; Booth, Broussard & Loist, 1997; Kong & Taghavi, 2006; Alegria, McKenzie & Wolfe, 2009).

However, little is known about the top performing companies in the stock exchange classified according to their different industries (Wang & King Phet, 2012). Therefore, this study focuses on evaluating the impact these announcements could have on the companies operating in the mining industry. This leads us to the research question stated below.

### **1.3.2 Research question**

The research question is as follows:

- Is there any significant impact of earnings announcements on the share prices of selected mining companies listed on the JSE?

Based on the above research question, the purpose of this study was formulated and presented in the next section below.

### **1.4 Purpose of the study**

The researcher had intended to conduct this study in order to extend the evidence from previous studies on how the earnings announcements influence the share price. The research results will benefit investors, share price analysts, portfolio managers and other stakeholders interested in earnings announcements to measure their share price movements. Evidence from analysing share price reaction to earnings announcements in developing markets (South Africa included), casts more light on whether the efficient market hypothesis is supported or contradicted by various empirical findings (Rono, 2013). In order to accomplish the purpose of the study, the objective presented below was developed.

### **1.5 Research objective**

The objective of this study is to evaluate the impact of earnings announcements on the share prices of selected mining companies listed on the JSE. In order to achieve this objective, the following hypotheses statements were formulated.

### **1.6 Hypothesis statement**

According to Lichtman (2013), a hypothesis is a formal statement about the relationship between two or more variables and it is associated with quantitative research. In this study, the researcher formulated the hypotheses statements as presented below.

**Hypotheses statements:** The null hypothesis ( $H_0$ ) and the alternative hypothesis ( $H_1$ ) are as follows:

**H<sub>0</sub>:** Abnormal returns obtained on the earnings announcement event window period will not be significantly different from zero.

**H<sub>1</sub>:** Abnormal returns obtained on the earnings announcement event window period will be significantly different from zero.

## **1.7 Definition of terms and concepts**

The terms and concepts that have been used in this study are defined in the paragraphs that follow, based on the context of the study.

**Impact:** According to the Cambridge Advanced Learners Dictionary (2013), impact is defined as the force or action of one object hitting another. In this research, the impact refers to the power of the earnings announcement on the share price of mining companies listed on the JSE.

**Earnings:** According to the Cambridge Advanced Learners Dictionary (2013), earnings are defined as a company's profits in a particular period.

**Announcement:** Cambridge Advanced Learners Dictionary (2013) defines announcement as a statement in spoken or written form that makes something known publicly. In this study, earnings and announcement are looked at as earnings announcement, referring to a public statement giving investors information on financial results and profits of a mining company listed on the JSE.

**Abnormal return:** The difference between the return on a stock and the performance of an index, such as the S&P 500. The abnormal return is equal to the market return - the normal return (Investorwords.com, 2015).

**Share price:** Collins English dictionary (2015) defines a share price as the price of an individual share in a company. In this study, a share price indicates a unit price of an individual share of a mining company listed on the JSE.

**Mining:** Mining is the process of extraction of valuable minerals from the earth or from an ore body. Mining techniques can be divided into two common categories: surface

mining (open cast) and underground mining (deep shaft) (Technology Innovation Agency, 2013).

**Company:** A company refers to any entity engaging in business, such as a proprietorship, partnership, or corporation (Investorwords.com, 2015). In this study, a company is looked at as a mining entity referring to a business enterprise involved in the process of extraction of valuable minerals from the earth.

**Johannesburg Stock Exchange:** It is the largest stock exchange on the entire African continent and is primarily dominated by mining companies (Investorwords.com, 2015) in terms of market capitalisation (Bloomberg, 2012). This is because it was originally established in 1887 by the mining industry as a technique to raise funds.

## **1.8 Research design and methodology**

### **1.8.1 Research design**

According to Creswell (2009), a research design is defined as a plan and procedure for research that spans the decisions from broad assumptions to detailed methods of data collection and analysis. It involves the intersection of philosophical assumptions, strategies of inquiry and specific methods.

### **1.8.2 Research method**

According to Creswell (2009), research methods represent the third major element that involves data collection, analysis and interpretation. These methods can be divided into quantitative, qualitative and/or mixed methods. This study will follow a quantitative event study methodology in collecting data. This methodology was developed and implemented in finance theory as far back as the 1930's by Dolley (1933).

An event study is a statistical technique that estimates the share price impact of occurrences such as mergers, earnings announcements and so forth (Corrado, 2011). The basic notion is to disentangle the effects of two types of information on share prices that is specific to the company under consideration (e.g. dividend announcement). An in-depth discussion about this method will be dealt with in Chapter 3 of this study.

### **1.8.3 Population and setting**

De Vos, Strydom, Fouché and Delport (2014) define population as the sampling frame that includes persons, events, organisation units, case records or other sampling units with which the research problem is concerned. This study focuses on selected mining companies listed on the JSE (main and alternative boards). The population of all basic resources companies was 67 and 35 of these companies were listed on the alternative board. The sample size consisted of 27 mining companies listed on the JSE as of October 2015 (JSE, 2015).

### **1.8.4 Sampling**

De Vos *et al.* (2014) define a sample as a small portion of the total sets of objects, events or persons from which a representative selection is made. The researcher followed a purposive, systematic and all-inclusive probability sampling techniques. In purposive sampling, the researcher's objective is to produce a sample that can be logically assumed to be representative of the population and would be appropriate for the study (Sennanye, 2015).

### **1.8.5 Data collection**

Data can be described as the precise and systematic gathering of the information needed to address a research problem (Mphuthi, 2010). Therefore, the method must be relevant to the research purpose or the specific objectives and questions. This study followed the event study methodology to conduct this research. This is a standard approach used in this study as established by Fama *et al.* (1969).

Annual financial reports of the mining companies listed on the JSE were analysed to check for the earnings figure and the announcement date. This information was found in the JSE website and the Stock Exchange News Service (SENS). The INET BFA (which is Africa's leading provider of financial data feeds and analysis tools) database was used to find information relating to each individual company's daily closing share price figures.

The event window was set at 25 days before, during the event and 25 days after the earnings announcement day. The information relating to share price movements

included in this study was tested against the earnings figures referred to in the preceding paragraph. The regression analysis methods were applied using Excel Spreadsheets to test the results.

### **1.8.6 Data analysis**

Data analysis involves breaking up the data into manageable themes, patterns, trends and relationships (Mouton, 2005). In this study, assistance was acquired from a qualified statistician to analyse quantitative data and the interpretation of the descriptive statistics derived from the data collected.

## **1.9 Validity and reliability**

### **1.9.1 Validity**

Kumar (2005) describes validity as the degree to which the research has measured what it has set out to measure. This study will focus only on the events taking place 25 days before the announcement day, the day of the announcement and 25 days after the announcement. There were no other external influences considered except as explained in the previous sentence.

### **1.9.2 Reliability**

Reliability is described as consistency of results with the data collected (Maree, 2009). The researcher ensured that the data used in this study portray the fair representation of the results. The researcher also ensured that the findings are as neutral as possible. It was ensured by the researcher that the appropriate methods of data collection and analysis were used in this study.

## **1.10 Ethical considerations**

The proposal was sent to the University of South Africa (UNISA) ethics committee for approval before commencement of the study. Names of the chosen companies remained anonymous and confidential in the study. The real names of these companies were kept behind lock and key as well as a password protected file and be accessed by the researcher and only people involved directly with this research. The coding system was used whereby a similar code used by the JSE was allocated to each company.

## **1.11 Delineation and limitations**

The research focused on the impact of earnings announcements on share prices of mining companies listed on the JSE. All mining companies listed on the JSE formed part of this study. The detailed explanation of delineation and limitations of this study were explained fully in the conclusion and summary of this research in Chapter 5.

## **1.12 Summary**

This chapter introduced the whole overview of the study, including: introduction; background to the study; brief literature review; problem statement; purpose of the study; research question; research objectives; hypothesis statement; definition of terms; research design; research methodology; validity; reliability; ethical considerations; and summary of this chapter.

The rest of the research will be structured as follows: Chapter 2 provides the literature review of the study with a thorough analysis on content of earnings announcements information and the impact on share price. The research methodology used to collect data together with the models applied is discussed in Chapter 3. In Chapter 4, the presentation and discussion of the results are reported while Chapter 5 provides the findings and discussion of the results together with the conclusions and recommendations for further studies.

# Chapter 2

## Literature review

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### 2.0 Introduction

The research conducted on the association of share price reaction to company announcements of earnings, dividends, issue of new shares and share splits has been documented extensively in the work of several capital market researchers (Ball & Brown, 1968; Beaver, 1968; Fama *et al.*, 1969; Ball & Kothari, 1991; Bhana, 1995; Coetzee, 2012).

Investigating the effect of corporate earnings announcements on the share price of mining companies in South Africa will add value to the current literature debates. Empirically testing the effects of earnings announcements on share prices of selected mining companies listed on the JSE will bring new knowledge to the South African market.

This chapter starts in section 2.1 by reviewing the mining industry and the developments in this sector of the economy. Section 2.2 discusses the brief history of the JSE. Section 2.3 introduces the concept of efficient market hypothesis while section 2.4 discusses market reaction to earnings announcements in different countries. Lastly, the author deliberates on the event study methodology in section 2.5 and concludes the chapter in section 2.6.

### 2.1 South African mining Industry

The Department of Mineral Resources (DMR) takes up the custodianship and responsibility of all mineral resources in South Africa on behalf of its citizens. The DMR promotes and regulates the Minerals and Mining Sector for transformation, growth and development as well as ensuring that all South Africans derive sustainable benefits from the country's mineral wealth (Department of Mineral Resources, 2015). The mining and minerals industry has played a pivotal role in the country's economic



development, which has transformed South Africa into the most industrialised country on the African continent.

The key strategic goals for the DMR (Department of Mineral Resources, 2015) are as follows:

- Promote and facilitate an increase in mining activity and in value added to mineral resources extracted in South Africa;
- Implement transformation policies that redress past imbalances through broader participation in the mineral sector;
- Provide a framework for managing health and safety risks, enforce compliance and promote best practice in the mineral sector;
- Promote sustainable resource management, contribute to skills development and the creation of sustainable jobs in the mining sector;
- Contribute to a reduction of the adverse impacts of mining on the environment;
- Attract, develop and retain appropriate skills and ensure the optimal utilisation of resources; and
- Implement risk management strategies and promote corporate governance.

The South African mining industry is the seventh largest in the world (Chamber of Mines, 2014). The Citibank estimated that in 2010 South Africa had about US\$2.5 trillion of mineral resources, and the mining industry is set to play an important role in the future of the country (Department of Mineral resources, 2013).

In terms of reserves, the country has been classified as the primary producer of platinum group metals, manganese, chromium, and gold. In 2013, the mining sector directly accounted for 8.3% of the GDP on a nominal basis. Although this is a downward trend from the industry's peak in 1970 where it recorded a 21% contribution to GDP, the mining industry nevertheless continues to make a valuable contribution to the South African economy (Chamber of Mines, 2014).

The sector brings in an annual income exceeding R330 billion and accounts for 20% of all investment in the country. Of the R441 billion in expenditure which the mining industry incurs, R407 billion is spent locally. The mining industry also contributes

significantly to the State Treasury, roughly R17 billion in corporate taxes and R6 billion in royalties (KPMG, 2013). In the past decade, the Chamber of Mines (2014) reported that the mining sector has contributed over R2.4 trillion to the country's GDP and a further R2.4 trillion to the country's export earnings in real money terms.

The industry contributes half a million jobs directly to the economy and around the same figure indirectly. It is considered a critical earner of foreign exchange of more than 50%. In addition, the listed mining companies represent around 20% of the market capitalisation on the JSE (Chamber of Mines, 2014). Table 2.1 below indicates the market capitalisation of mining companies listed on the JSE with a market value above one million rand (INET BFA, 2016);

**Table 2.1: Market Capitalisation of JSE Listed Mining Companies**

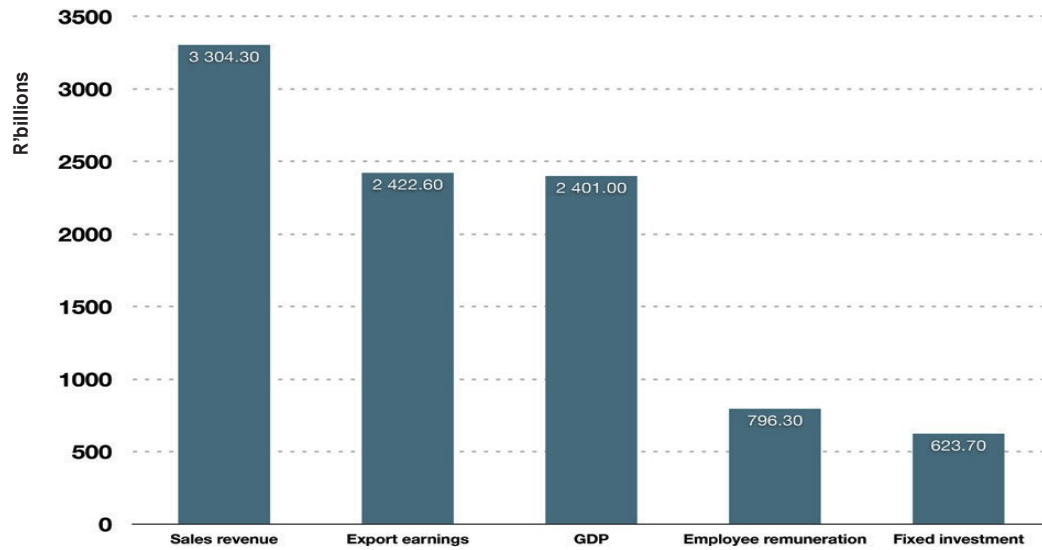
NO.	Name	JSE:Code		31/03/2016
1	Glencore Plc	GLN	R	481 928 050 180.00
2	BHP Billiton Plc	BIL	R	350 603 918 136.00
3	Anglo American Plc	AGL	R	162 359 644 876.00
4	Anglo American Plat Ltd	AMS	R	97 592 480 905.00
5	South32 Limited	S32	R	88 214 751 269.00
6	AngloGold Ashanti Ltd	ANG	R	83 299 023 037.00
7	Sibanye Gold Limited	SGL	R	51 918 789 282.00
8	Gold Fields Ltd	GFI	R	48 018 586 724.00
9	Impala Platinum Holdings Ltd	IMP	R	34 534 583 766.00
10	Exxaro Resources Ltd	EXX	R	25 784 316 360.00
11	Harmony Gm Co Ltd	HAR	R	23 169 558 010.00
12	Assore Ltd	ASR	R	22 476 727 000.00
13	Northam Platinum Ltd	NHM	R	21 446 495 588.00
14	African Rainbow Min Ltd	ARI	R	20 715 124 908.00
15	Oakbay Res And Energy Ltd	ORL	R	16 800 000 000.00
16	Lonmin Plc	LON	R	7 926 875 934.00
17	Royal Bafokeng Platinum	RBP	R	7 415 845 596.00
18	Pan African Resource Plc	PAN	R	5 347 964 707.00
19	DRD Gold Ltd	DRD	R	2 568 067 251.00
20	Impala Platinum Holdings Ltd	IMP	R	2 217 760 000.00
21	Merafe Resources Ltd	MRF	R	1 908 135 228.00
22	Tharisa Plc	THA	R	1 740 064 824.00
23	Diamondcorp Plc	DMC	R	1 046 704 680.00
24	Coal Of Africa Ltd	CZA	R	982 770 677.00
25	Eastern Platinum Ltd	EPS	R	926 390 320.00
26	Wesizwe Platinum Ltd	WEZ	R	781 356 987.00
27	Petmin Ltd	PET	R	646 137 170.00
28	Jubilee Platinum Plc	JBL	R	611 950 006.00
29	Buffalo Coal Corp	BUC	R	487 937 090.00

30	Great Basin Gold Ltd	GBG	R	386 705 505.00
31	Trans Hex Group Ltd	TSX	R	376 482 026.00
32	Wescoal Holdings Ltd	WSL	R	363 426 374.00
33	Atlatsa Resources Corp	ATL	R	360 287 506.00
34	Kibo Mining Plc	KBO	R	328 676 022.00
35	Resource Generation Ltd	RSG	R	290 690 169.00
36	Firestone Energy Limited	FSE	R	212 981 923.00
37	Sentula Mining Ltd	SNU	R	186 810 318.00
38	Randgold & Exploration Co Ltd	RNG	R	183 479 259.00
39	Keaton Energy Holdings Ltd	KEH	R	163 516 783.00
40	Bauba Platinum Limited	BAU	R	132 657 087.00
41	The Waterberg Coal Co Lt	WCC	R	125 306 085.00
42	Middle East Diamond Resources	MED	R	104 430 364.00
43	Delrand Resources Ltd	DRN	R	92 027 175.00
44	Central Rand Gold Ltd	CRD	R	90 668 040.00
45	Soapstone Investment Ltd	DMCCB	R	88 000 000.00
46	South African Coal Mining	SAH	R	76 917 214.00
47	Hwange Colliery Ltd	HWA	R	69 920 426.00
48	Tawana Resources NI	TAW	R	44 257 511.00
49	Rockwell Diamonds Inc.	RDI	R	43 986 595.00
50	Buildmax Ltd	BDM	R	32 634 151.00
51	Miranda Mineral Holdings Ltd	MMH	R	28 446 158.00
52	Chrometco Ltd	CMO	R	27 492 868.00
53	Platfields Limited	PLL	R	15 791 940.00
54	Firestone Energy Ltd	FSE	R	1 695 300.00
<b>TOTAL</b>			<b>R</b>	<b>1 567 297 297 310.00</b>

*Source: INET BFA, 2016*

The South African mineral sales increased by 5.8% in 2013 to R384.9 billion. This follows a 1.9% contraction in mineral sales in 2012. This change in mineral sales in 2013 was driven by a 5.4% growth in coal sales to an amount of R101.4 billion, a 33.2% rise in manganese sales to R14.4 billion and a 20% increase in iron ore sales to R63.1 billion. Figure 2.1 below shows the contribution of the mining industry in South Africa over the past decade (Chamber of Mines, 2014).

**Figure 2.1: The contribution of mining to SA over the past decade expressed in 2013 real money terms**



*Source: Chamber of mines Statistical Unit, 2014*

### 2.1.1 The Mineral wealth of South Africa

The mining industry is a well-established and resourceful sector of South Africa's economy, and offers a high degree of technical expertise supplemented by the ability to mobilise capital for new projects (Department of Mineral Resources, 2015). With the diversity and abundance of its natural ore deposits, South Africa is a leading producer and supplier of a range of mineral resources.

In 2013, the country produced approximately 53 different minerals from 1 712 mines and quarries. In 2014, this figure had increased to roughly 60 minerals with some prospects of exploitation of two new minerals in a short to medium term (Department of Mineral Resources, 2015).

Table 2.2 below depicts the total number of mines involved in the extraction of these mineral resources.

**Table 2.2: Number of mines in a mineral grouping**

<b>Minerals</b>	<b>Number of mines</b>
Gold	53
Platinum Group Metals	43
Coal	143
Diamonds	388
Other	1085
Total	1 712

**Source:** *Mineral resources handbook, 2015*

South Africa's mineral wealth is typically found in the following geological formations and settings (Department of Mineral Resources, 2015):

- The Witwatersrand Basin yields some 93% of South Africa's gold output and contains considerable uranium, silver, pyrite and osmiridium resources;
- The Bushveld Complex is known for platinum group metals (PGMs) (with associated copper, nickel and cobalt mineralisation), chromium and vanadium-bearing titanium-iron ore formations and industrial minerals, including fluor spar and andalusite;
- The Transvaal Supergroup contains enormous deposits of manganese and iron ore;
- The Karoo Basin extends through Mpumalanga, Kwazulu-Natal, the Free State and Limpopo, hosting considerable bituminous coal and anthracite resources;
- The Phalaborwa Igneous Complex hosts extensive deposits of copper, phosphate, titanium, vermiculite, feldspar and zirconium ores;
- Kimberlite pipes host diamonds that also occur in alluvial, fluvial and marine settings;
- Heavy mineral sands contain ilmenite, rutile and zircon; and
- Significant deposits of lead-zinc ores associated with copper and silver are found near Aggeneys in the Northern Cape.

South Africa dominated the global gold production in the 20<sup>th</sup> century - there are 53 gold mines operating in South Africa (Table 2.2). The country accounts for 11% of the world's gold reserves, with one of the deepest mines in the world. The TauTona Mine

which is part of Anglo Gold South Africa extends 3,9 km underground (Department of Mineral Resources, 2014).

The gold mining industry had a strong influence on the currency of the country. The South African Rand was introduced in 1961 replacing the British Pound. The currency is named after the Witwatersrand (also called “The Rand”) in which 93% of South Africa’s gold deposits are found (KPMG, 2013). The Rand continues to be linked to mining, minerals and metals which contribute the major portion of our export revenue. The foreign currency exchange value is highly sensitive to the price of minerals and production. Moreover, it fluctuates as the price of gold and other commodities rises and drops even further when there is labour unrest on the mines (KPMG, 2013).

Second on the list of minerals most valuable to the South African economy is Platinum Group Metals which accounts for 96% of known global reserves. The Bushveld complex is known for large deposits of platinum, palladium, rhodium, osmium, ruthenium, and iridium which occur together in nature alongside nickel and copper. The area is called the Merensky Reef that covers the Southern part of Zimbabwe through to Rustenburg. The DMR (2014) states that this is the centre of platinum mining in South Africa, playing host to mining companies such as the Rustenburg Platinum mines and the Bafokeng Rasemone Platinum mines.

Coal is the largest contributor to the economy in terms of revenue generation, and comes third on the list of valuable minerals (Table 2.3). In the national energy plan, it remains an important component of the country’s energy mix (Department of Mineral Resources, 2014). Last, but not least are the diamonds, with South Africa ranking fourth in terms of value after Canada, Russia and Botswana. Most importantly, the country plans to process a greater portion of its germs locally to maximise its profits. The government wants to cut and refine 70% of the mined diamonds in South Africa by 2023. This is an effort to create employment by industrialising the country through beneficiation of the precious stones by exporting finished products.

Table 2.3 below indicates the mineral contribution to the South African economy.

**Table 2.3: Commodity summary for January to December 2013**

<b>Commodity</b>	<b>Local sales</b>	<b>Total sales</b>	<b>Total exports</b>	<b>% Export</b>
	<b>R 1 000</b>	<b>R 1 000</b>	<b>R 1 000</b>	<b>Sales</b>
Gold	3 312 818	57 158 710	53 845 893	94.2
Platinum Grp Metals	8 886 103	84 234 637	75 348 535	89.5
Diamonds	7 543 783	12 335 974	4 792 191	38.8
Silver	43 179	452 851	409 672	90.5
<b>Sub total</b>	<b>19 785 882</b>	<b>154 182 172</b>	<b>134 396 290</b>	<b>78.2</b>
Chrome	5 870 717	11 762 549	5 891 833	50.1
Copper(Content)	4 056 792	5 817 573	1 760 781	30.3
Iron Ore	5 782 442	63 142 942	57 360 500	90.8
Lead Concentrate	0	683 220	683 220	100
Manganese	1 506 434	14 416 184	12 909 750	89.6
Nickel	1 216 372	6 957 625	5 741 253	82.5
Other Metallic	11 868	540 781	528 913	97.8
Coal	49 569 211	101 382 695	51 813 484	51.1
Feldspar	101 444	101 444	0	0
Limestone & Lime	2 804 944	2 825 483	20 539	0.7
Other Non-metallic	9 215 171	9 383 214	168 043	1.8
Miscellaneous *	5 477 748	13 745 787	8 268 039	60.1
<b>Sub total</b>	<b>85 613 144</b>	<b>230 759 498</b>	<b>145 146 354</b>	<b>62.9</b>
<b>GRAND TOTAL</b>	<b>105 399 026</b>	<b>384 941 670</b>	<b>279 542 644</b>	<b>72.6</b>

*Source: Minerals Bureau, Department of Mineral Resources, as at September 2014*

*\*Includes strategic & minor commodities otherwise not enumerated. Note; totals might not add due to rounding.*

### 2.1.2 Role players in the mining industry

There are a number of role players in the South African mining industry. Each one of these stakeholders has a different task to play to promote equal opportunities for the citizens of this country (Department of Mineral Resources, 2014). These role players are as follows:

- Mining Qualifications Authority (MQA);
- Chamber of Mines;
- South African Mining Development Association (SAMDA);
- South African Diamond and Precious Metals Regulator (SADPMR);
- Council for Mineral Technology and Research (Mintek);
- Mine Health and Safety Council (MHSC);
- Council for Geoscience (CGS);
- State Diamond Trader (SDT);

- Petroleum Agency South Africa (PASA);
- African Mining Partnership (AMP);
- Association of African Diamond Producing Countries (ADPA); and
- The Kimberley Process (KP).

There are a number of other voluntary associations not mentioned above such as the South African Institute of Mining and Metallurgy (SAIMM). The aim of this association is to assist its members to source news and views about the technological developments in the mining, metallurgical and related sectors. The author is of the opinion that the role players listed above play an important role in the mining sector. In addition, the Chamber of Mines will be explored further in the following section.

### **2.1.3 Chamber of Mines**

The Chamber of Mines of South Africa is a voluntary, private sector employers' organisation founded in 1889. It was established only three years after gold discovery in the Witwatersrand area (Department of Mineral Resources, 2014). It is an association of mines and mining companies operating in the gold, coal, diamond, platinum group metals and other mineral commodity sectors.

The organisation acts as the principal advocate of the major policy agreements endorsed by the mining employers. It also represents the formalised views of its membership to various organs of government, and to other relevant policy-making entities, both within the borders and outside the country (Department of Mineral Resources, 2014).

### **2.1.4 Mining Charter**

The introduction of the Mining Charter in South Africa was aimed at transforming the mining industry to redress historical imbalances. This was to ensure that the industry is aligned with the changes in the country's overall transformation of its social, political and economic landscape. The Mining Charter was introduced in 2004 and provided an initial window of 10 years for the industry to effect meaningful transformation (Department of Mineral Resources, 2014).



The Mining Charter sets out targets, measures and weightings on how mining rights holders are assessed in line with the respective elements of the framework (see Appendix B).

#### **2.1.5. Mine health and safety**

South Africa's Mine Health and Safety act (MHSA), introduced in 2006, was considered to be fairly radical, as it made provision for industry, the unions and government to work together in promoting a safe and healthy workplace. As required by the MHSA, individual companies and mines have agreements in place that regulate many aspects of safety and health in the workplace (Chamber of Mines, 2015).

Since 1994, the number of mining fatalities has been reduced by 88%. Although the number of employees has risen in this period, the mining industry during 2015 had a total of 77 fatalities. The Chamber of Mines (2015) points out that this figure is the lowest in the history of the industry. The following table (Table 2.4) indicates that there is a downward trend in the number of people killed in the mines since 1994; this can be attributed to the introduction of the MHSA.

<b>Table 2.4: Industry fatalities, 2004 -2013</b>										
<b>Commodity</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>
Gold	108	105	114	115	85	81	62	51	53	37
PGM's	65	47	40	53	36	41	34	37	28	28
Coal	20	16	20	15	20	18	12	12	11	7
Chrome	16	6	2	4	*	*	*	*	*	*
Diamonds	15	7	3	12	*	*	*	*	*	*
Copper	2	0	2	1	*	*	*	*	*	*
Clay	3	3	2	8	*	*	*	*	*	*
Iron Ore	1	2	2	4	*	*	*	*	*	*
Granite DS	2	0	0	1	*	*	*	*	*	*
Limestone	3	5	5	1	*	*	*	*	*	*
Other	11	10	10	6	30	28	19	23	20	21
<b>TOTAL</b>	<b>246</b>	<b>201</b>	<b>200</b>	<b>220</b>	<b>171</b>	<b>168</b>	<b>127</b>	<b>123</b>	<b>112</b>	<b>93</b>

*Source: Department of mineral resources, 2013*

### **2.1.6 Illegal mining**

The Chamber of Mines South Africa (2016) asserts that illegal mining is on the rise in this country. It is said to take place in both abandoned mines and in many cases even at the mines which are still operating. The surge in illegal mining can be attributed to the following factors:

- An increase in unemployment in the country;
- The price of gold in the international markets; and
- Lack of resources in the law enforcement department.

The above discussion was to highlight the contribution and the challenges faced by the mining industry in South Africa. The following section will focus more on the formation and operations of the JSE.

## 2.2 Johannesburg Securities Exchange

The mining industry in South Africa directly contributed to the establishment of the JSE in the late 19<sup>th</sup> century (Projects IQ, 2015). The JSE is the main securities exchange currently in operation in South Africa. It was founded in 1887 mainly to provide a facility through which investors could trade in shares and other tradable commodities. Currently, there are approximately 400 companies listed on the JSE (JSE, 2015). Companies in different industries opt to register on the JSE to enjoy the benefits of listing such as that it is often easier to raise equity capital rather than relying on debt finance (JSE, 2015).

The JSE is the most liquid stock market in Africa (Africanbusinesscentral.com, 2014). All companies listed on this platform enjoy the benefits such as; should a company require additional capital, it is able to raise funds via a private placement, preferential offer, public offer, a rights issue or a combination thereof, which will immediately strengthen the company's statement of financial position (see Appendix C).

However, there are also disadvantages of listing in the JSE, For example, initial listing costs, although once-off they are viewed to be too high, hence there is need for another exchange in this country (Appendix C). The introduction of the second stock exchange (ZAR X) on the 1<sup>st</sup> of September 2016 is likely to bring competition to the JSE. It is the researcher's assumption that the country will benefit in these new competitiveness because prices would be determined by market forces rather than a single monopoly.

During 2012, the South African mining sector accounted for 24,7% (R1,8 trillion) of the JSE all-share index, and the industry managed to spend 80% of the R488 billion expenditure within the South African borders (Sennanye, 2015). This sector is the significant contributor to the South African economy. For instance, the Chamber of Mines of South Africa (2013) has indicated that it contributes to employment numbers, export earnings, attracting foreign direct investment, contributions to GDP, measured and sustained transformation of the economy.

The next section will discuss the market system in the developing and developed countries.

## 2.3 Operations of the Market System

As introduced in chapter 1 of this study, according to the Efficient Market Hypothesis (EMH), a market price of a share reflects the true price of a share, as the market price of a share reflects all available value-relevant information (Malkiel & Fama, 1970). It is assumed that rational investors can determine the expected future cash flows of a share, its riskiness, the appropriate discount rate to apply to the share's expected cash flows. In spite of the EMH (Malkiel & Fama, 1970) distinguish three different degrees of efficiency in the market:

- The *weak-form efficiency*, the share price reflects its historical prices, which means that future prices cannot be predicted by analysing prices from the past;
- The *semi strong-form efficiency*, the share price reflects all publicly available information; so, no excess return can be earned by trading on this information. However, profit can be made from information that is not publicly available; and
- The *strong-form efficiency*, the share price reflects all information, this is the case where the abnormal returns equal zero.

There are also other theories surrounding this topic as mentioned earlier in chapter one, Kendall (1953) posits that future movement of a share price cannot be predicted by past movements, this is called Random Walk theory. Secondly, there is Signalling theory which provides a practical and empirically testable perspective on problems of social selection under conditions of imperfect information (Connelly, Certo, Ireland & Reutzel, 2011). In this study the researcher will follow an efficient market hypothesis.

Studies of efficient market hypothesis were largely pioneered in the USA and the UK as early as the 1960's. Thereafter, more studies by the rest of the world followed (Ball & Brown, 1968; Beaver, 1968; Fama *et al.* 1969). However, in South Africa, this area has not been explored in an exhaustive manner, especially focusing on the listed companies classified according to different industries.

The debate has been whether accounting income numbers have any relationship with the share price (Ball & Brown, 1968; Ball & Brown, 2014). In their seminal work, the latter researchers found that accounting net income had an impact on the share price.

However, after considering their results at the time, and during their follow-up research paper, they concluded that accounting is a viable area for market-based and information-economics reasoning (Ball & Brown, 2014).

## **2.4 Market reaction around earnings announcements**

The share price reaction to earnings announcements in the mining industry forms the basis of this study. The relationship between earnings figures and share price has been a topic of international research for decades (Dimitropoulos, 2009). To better understand this concept, and formulate the hypothesis and predictions that will be included in the study, extant literature has to be examined.

Various studies have been conducted in order to determine the true market reaction to the announcements of earnings by mining companies. They include among others studies conducted by Ball and Brown (1968), Fama *et al.* (1969), Malkiel and Fama (1970), Khothari (2001), Kong and Taghavi (2006), Alegria *et al.* (2009), Wang and King Phet (2012) as well as Rono (2013). Although these studies tested the market reaction to earnings announcements they were not specific to the mining industry.

The following sections will focus on the market reaction to earnings announcements in the USA, UK, China, Nordic countries, Nigeria and the South African stock markets. Each one of these countries will be discussed based on a particular study conducted in that country. Each study within each of the above-mentioned countries will be discussed focusing on the purpose of the study, methodology adopted and the results and conclusion made.

The USA is the first country where the market reaction to earnings announcements will be investigated. The author selected to start with the USA based on the fact that the topic under discussion originated in this country (Khothari, 2001).

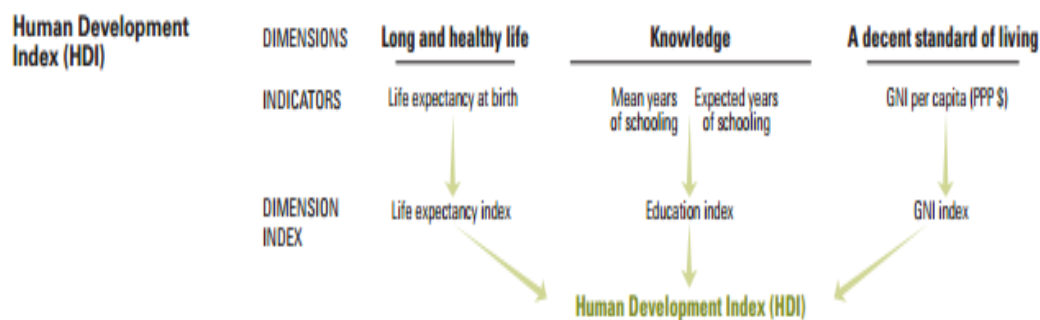
### **2.4.1 Market reaction around earnings announcements in the USA**

The USA has more than 20 stock exchanges operating in the country (World stock exchanges, 2016). The researcher focused on the New York Stock Exchange (NYSE) which is used in most studies to conduct research on capital markets. The NYSE is one

of the oldest stock exchanges in the world; its history can be traced back to 1792 when 24 brokers signed the Buttonwood Agreement outside of 68 Wall Street in New York to begin trading securities (NYSE, 2016).

Currently, there are more than 12 000 listed contracts and securities on the NYSE with a market capitalisation of \$25 trillion of listed companies. In 2014, the USA was ranked 8<sup>th</sup> (Appendix D) in the Human Development Index (HDI) as one of the most developed countries in the world (UNDP, 2015). The HDI is a measure of average achievement in key areas of human development. The index focuses on long and healthy life of humans, knowledge/education and a decent standard of living. Figure 2.2 gives clarity on how the index was developed.

**Figure: 2.2: Schematic presentation of the Human Development Index**



*Source: UNDP, 2015*

Studies conducted in financial markets in the USA are widespread. They include the research paper by Ball and Brown (1968) as well as Beaver (1968) which were seen as the ground-breaking papers in capital markets research. There are many developments in research in this part of the world (Fama, Fisher, Jensen & Roll, 1969; Patell, 1976; Ball & Kothari, 1991; Ball & Shivakumar, 2008 and Bartov, Radhakrishnan & Krinsky 2000). Bartov, Radhakrishnan and Krinsky (2000) investigated investor sophistication and patterns in stock returns after earnings announcements. The findings of their research are discussed below.

#### 2.4.1.1 Purpose of the study

Bartov *et al.* (2000) tested whether the observed patterns in stock returns after quarterly earnings announcements are related to the proportion of firm shares held by institutional

investors. The authors further investigate whether drift (investor under-reaction to earnings announcements) is a manifestation of inefficient processing of quarterly earnings by examining the relation between drift and investor sophistication.

#### **2.4.1.2 Methodology applied in the study**

Bartov *et al.* (2000) conducted a standard event study methodology based upon the estimation of abnormal share returns over a given time period/window. The sample consisted of 19 777 firm-quarter (firms that met the criteria set below) observations from the fourth fiscal-year quarter of 1984 to the fourth fiscal-year quarter of 1993 for NYSE/Amex firms. The sample selected was tested for the following:

- That earnings before extraordinary items and discontinued operations be available on the quarterly Compustat database for 21 consecutive quarters in the interval from the third quarter of 1984 through the fourth quarter of 1993.;
- Data on institutional holdings for each firm-quarter meeting the first set of requirements from the CDA/Spectrum database (the database contains the total number of common shares held by institutions at the end of each calendar quarter);
- The Centre for Research in Security Prices (CRSP) database for each quarterly earnings announcement; and
- 0.25 percent of extreme observations were deleted from each tail (the researcher used this measure to control for extreme events) based on the abnormal-return variables.

#### **2.4.1.3 Results, findings and conclusions**

The results from the study by Bartov *et al.* (2000) indicate that the coefficient estimates on the earnings-surprise variables are positive and significant (ordinary investors reacted positively to the earnings announcements), and the coefficient estimates on the institutional holdings variables are negative and significant (institutional investors reacted negatively to the news). This was depicted by the two dependent variables, Abnormal Return for 12 days (AR12) and Cumulative Abnormal Return for 60 days (CAR60).

In conclusion, the authors found that Post-Earnings-Announcement Drift (PEAD) is related to the percentage ownership of institutional investors and that this relationship

exists even when transaction costs and firm size are controlled. The researchers also contend that the degree of inefficient pricing in the amount of drift in abnormal security returns subsequent to quarterly earnings announcements is related to the proportion of a firm's stock held by institutions.

#### **2.4.2 Market reaction around earnings announcements in the UK**

The London Stock Exchange Group (LSEG) is one of the oldest stock exchanges in the world; its history can be traced back to more than 300 years ago. Currently, there are 2 339 listed companies on the stock exchange with a market value of £3 879 397 million (LSEG, 2016).

In 2014, the UK was ranked 14<sup>th</sup> in the Human Development Index (HDI) as one of the most developed countries in the world (UNDP, 2015). Studies conducted in financial markets similar to the USA are widespread. Among these studies is the research by Alegria *et al.* (2009).

##### **2.4.2.1 Purpose of the study**

Alegria *et al.* (2009) investigated the abnormal share return dispersion occurring when companies announce their interim or final earnings. The authors examined the mid-to-large capitalisation UK companies listed on the LSEG for the period 1984 to 2005. The researchers extended their analysis further by calculating the Cumulative Abnormal Returns (CAR) conditionally upon an extreme event on the announcement date.

##### **2.4.2.2 Methodology applied in the study**

The study conducted by Alegria *et al.* (2009) adopted an approach similar to the research carried out by Fama (1965) and Mandelbrot (1963). The researchers performed a standard event study methodology based upon the estimation of abnormal share returns over a given window. Alegria *et al.* (2009) adopted the single index market model as a benchmark which is suitable for the relatively short time window.

The sample consisted of all companies that were upgraded/ (downgraded) from/ (to) the FTSE250 to/ (from) the FTSE100 market index on the LSEG for the period January



1984 until November 2004. The event window was 201 days that is 100 days before the earnings announcement, the announcement day and 100 days after the earnings announcement.

For the 201 days event window, the authors calculated the following values for analysis:

- Abnormal returns;
- Cumulative abnormal returns;
- Extreme returns;
- Behaviour over different time periods; and
- Abnormal returns after an extreme event.

#### **2.4.2.3 Results, findings and conclusions**

The results obtained in the study conducted by Alegria *et al.* (2009) indicated that following the announcement of earnings, there is a higher than normal dispersion of the share prices on the event date. This is observed when investigating the dispersion of abnormal returns.

The authors also found there is evidence of return predictability conditional upon the occurrence of an extreme event on the announcement date. However, when analysing the abnormal returns on the day following an extreme event, the results showed no correlation.

Furthermore, Alegria *et al.* (2009) assert that this work might have implications for diversification and risk minimisation in portfolio management, that is the knowledge of possible large share price decreases on given dates can provide an effective tool for managers to reduce portfolio volatility.

#### **2.4.3 Market reaction around earnings announcements in China**

The Shenzhen and Shanghai stock exchanges are the two stock exchanges operating in China. Both stock exchanges were opened and started operations in 1990. There are currently 1 759 companies listed on the Shenzhen stock exchange (SZSE, 2016), and about 1 089 listed companies on the Shanghai Stock Market (SSE, 2016).

In 2014, China was ranked 90<sup>th</sup> in the Human Development Index (HDI) as one of the developed countries in the world (UNDP, 2015). Studies conducted in Chinese financial markets include studies by Chen Hanwen and Chen Xiangmin (2002), Chen Xiao and Liu Zhao (1999) and Zhao (1998). Among the list of studies done in China is the research by Kong and Taghavi (2006).

#### **2.4.3.1 Purpose of the study**

Kong and Taghavi (2006) evaluated the effect of annual earnings announcements on the Chinese stock markets. The study was conducted on 1224 companies listed on the Shanghai (698) and Shenzhen (526) stock exchanges for the year 2001. The authors extended their research to discover the precise quantitative relationship between the earnings and the yield shift.

#### **2.4.3.2 Methodology applied in the study**

The study conducted by Kong and Taghavi (2006) applied the EGARCH model to examine and evaluate the effects of announcement news on the conditional volatility of the abnormal return changes in the events window. The time window was set at 10 days before and 10 days after the publication of earnings information disclosure for the selected companies.

As mentioned in the preceding section, the sample comprised all companies listed on both stock exchanges. There were 3 672 day observations on the earnings and losses announcements conducted and 23 680 observations on daily stock price returns in the period around the announcement day.

#### **2.4.3.3 Results, findings and conclusions**

The results obtained in the study conducted by Kong and Taghavi (2006) demonstrated that the changes of the news variable significantly influence the mean of abnormal return in that the mean of abnormal return markedly increases four days before announcement, while it also decreases four days after announcement. The authors further indicate that there is advanced over-reaction in both the Shanghai and

Shenzhen stock markets towards the annual earnings announcement by four to six days before announcement.

However, these stock markets showed a remarkable rectification of four to six days after announcement to readjust the over-reaction. Based on their empirical investigation, the researchers conclude that the Chinese stock markets fail to represent a semi-strong-form efficiency towards annual earnings announcements.

#### **2.4.4 Market reaction around earnings announcements in Nordic countries**

The OMX Nordic Exchange is among the oldest stock exchanges in the world; its history can be traced back to 1808 when the Copenhagen Securities Exchange started its operations. The Nordic region comprises of five (5) countries, namely; Denmark, Finland, Iceland, Norway and Sweden (UNGC, 2016). There are currently 625 companies listed on the OMX Nordic Stock Exchange.

The five countries mentioned above are on the list of top 50 most developed nations in the world according to the HDI (UNDP, 2015). Norway is ranked number one (1) in the world as the most developed country in the world, whereas Denmark comes in fourth, place Sweden 14th, Iceland 16th and Finland 24th. Studies conducted in the Nordic region on capital markets include a master's thesis by Wang and King Phet (2012).

##### **2.4.4.1 Purpose of the study**

The thesis paper by Wang and King Phet (2012) examined the impact of earnings announcements on the stock return performance. The authors evaluated the 40 largest and most liquid stocks on the virtual OMX Nordic exchange from 2010 to 2012. Their analysis focused on three different subdivisions:

- Abnormal returns during an event window of 17 days;
- The cumulative abnormal return during the event window period; and
- Stock price behaviour from growth stocks and value stocks.

#### **2.4.4.2 Methodology applied in the study**

The thesis paper authored by Wang and King Phet (2012) adopted an approach similar to the research conducted by Alegria *et al.* (2009) and Kim and Verrecchia (1991). The authors performed the standard event study methodology to measure the impact of an announcement on the firm's stock price. They argued that this method is suitable for their research because it gauges the impact of good or bad news on the stock price.

The sample selection was taken from the constituents of the OMX Nordic 40 index, focusing on the quarterly announced earnings for the fiscal years 2010 to 2012. The reasons cited by the authors for selecting the OMX Nordic 40 index is that it is a market capitalisation weighted stock index mapping 40 of the largest and most liquid stocks on the virtual OMX Nordic Exchange.

#### **2.4.4.3 Results, findings and conclusions**

The results found in the study conducted by Wang and King Phet (2012) show that stock behaviour does respond gradually to the earnings announcement, and price reactions which appear within the pre-event window may indicate information leakage. The results also show that most AAR is statistically insignificant during the event window, which suggests that earnings information has a lower impact on the stock market.

The authors also found that the effect of positive earnings surprise on stock price lasts longer than that of the negative earnings surprise. Wang and King Phet (2012) concluded that stocks from the OMX Nordic index have a stable reaction on negative earnings surprise. Furthermore, when performing stock behaviour on growth and value stocks, it was found that value firms give less stock reaction to both positive earnings surprise and negative earnings surprise than growth firms.

#### **2.4.5 Market reaction around earnings announcements in Nigeria**

The Nigerian Stock Exchange (NSE) was established in 1960 as the Lagos Stock Exchange and was renamed NSE in 1977. However, trading of 19 securities started a

year later. There are currently 180 companies listed on the Nigerian Stock Exchange, with a market capitalisation of roughly N8.7 trillion (NSE, 2016).

Nigeria was ranked number 152 by the Human Development Index (HDI) as one of the least developed countries in the world (UNDP, 2015). Among the list of studies conducted in the Nigerian capital markets include that of Olowe, (1998), Oludoyi, (1999) and Adelegan, (2004). Following the work of the above scholars Afego, (2013) expanded the literature of the Nigerian financial markets by his latest work at the University of Dundee.

#### **2.4.5.1 Purpose of the study**

Afego, (2013) examined the stock market reaction to annual earnings information releases using data on the Nigerian Stock Exchange. The researcher tests the speed of reaction of the market to annual earnings information releases for a sample of 16 firms listed on the exchange.

#### **2.4.5.2 Methodology applied in the study**

The standard event study methodology was used in this study. The event window of 51 days was chosen for 25 days before and 25 days after the earnings announcement day. Daily closing prices and annual earnings announcement dates were obtained from a sample of firms listed on the NSE between 2005 and 2008 (inclusive).

The sample selection was based primarily on the criteria that only firms with the required financial and market information during the period 2005 to 2008 were included in the study (Afego, 2013). The selection criteria adopted by the author resulted in a final sample of 44 earnings announcements for a total of 16 firms over the 4-year period 2005 to 2008.

#### **2.4.5.3 Results, findings and conclusions**

The results from the study conducted by Afego (2013) suggest that stock price changes in Nigeria, with respect to earnings announcements, are not random but follow a specific pattern. This pattern makes it possible for negative abnormal returns by

trading around earnings announcement dates. Nevertheless, Nigerian investors do not benefit from the earnings announcement news. This could be attributed to the lack of appropriate investment analysis tools or insider trading as mentioned in the next paragraph.

As far as Afego (2013) is concerned, the magnitude of the cumulative abnormal returns is dominated by significant reactions 20 days before the earnings release date. This suggests that a portion of the market reaction may be due to private acquisition and, possibly, abuse of information by insiders.

#### **2.4.6 Market reaction around earnings announcements in South Africa**

As mentioned earlier in section 2.2, the JSE is the main stock exchange currently operating in South Africa. It was founded more than a century ago, mainly to provide a facility through which investors could trade in shares and other tradable commodities. There are currently 392 companies listed on the JSE (INET BFA, 2016), with a market capitalisation of \$0,9 trillion (ASEA, 2016).

In 2014, South Africa was ranked number 116 in the Human Development Index (HDI) as one of the developing countries in the world (UNDP, 2015). Studies conducted in the South African securities markets include that of Bhana (1995), Graham and Uliana (2001), Rono (2013) and Chipeta and Vokwana (2011). Among the recent studies on the capital markets research in South Africa is the work of Mlonzi, Kruger and Nthoesane (2011).

##### **2.4.6.1 Purpose of the study**

Mlonzi *et al.* (2011) investigate whether there are any significant abnormal returns around the public announcement of earnings. In addition, their study intended to establish whether the efficient capital market hypothesis applies to the (JSE alternative board of exchange) ALtX market. The authors examine all companies listed on the JSE-ALtX that announced their annual earnings between 1 January and 31 December 2009.

#### **2.4.6.2 Methodology applied in the study**

The population of this study as mentioned in the preceding section included all companies listed on the JSE-ALtX, which announced annual earnings between 1 January and 31 December 2009. The method for calculating the required returns using the Capital Asset Pricing Model (CAPM) with the emphasis on the single beta model, was applied (Mlonzi *et al.*, 2011).

The event study methodology was employed to test for abnormal performance and market efficiency. The data used included the daily closing prices for all shares listed on the ALtX that announced earnings during the years under consideration.

#### **2.4.6.3 Results, findings and conclusions**

The authors found that empirical evidence demonstrates that there is substantial negative share price reaction to earnings announcement on the ALtX stock market. They further point out that the ALtX stock market shows the weak form of market efficiency. Furthermore, the researchers concluded that during a recessionary period shareholders' wealth is eroded in the small ALtX market (Mlonzi *et al.* 2011).

However, the weak form of market efficiency provides opportunities for entrepreneurs and investors to exploit the market for profits when the market is performing well. In the foregoing sections, different studies of market reaction to earnings announcement news have been discussed; the next section will focus on the methodology used in this study.

### **2.5 Event study methodology**

In reviewing event study methodology, Corrado (2011) established that this method of study was introduced to a broader audience by Ball and Brown (1968) as well as Fama *et al.* (1969). However, these two papers were not the first to use event study methodology. Corrado (2011) further highlights an earlier event study by Dolley (1933) who examined stock price reaction to stock splits.

Kothari and Warner (2007) conducted a meta-analysis study in which they reported a conservative figure of 565 articles that were published in five major finance publications

between the years 1974 and 2000. However, Fama (1998) as well as Kothari and Warner (2007) provided an overview of the standard event study methods, and posit that short-time methods can be trusted.

The short time periods can be measured in days; Afego (2013) used daily data and set an event window of 41 days to test the stock price response to earnings announcement in the Nigerian Stock Exchange. The first step is to identify the date upon which the market would have received information about the announcement of earnings. The second step estimates the abnormal return (AR) on the shares gained from the announcement. Furthermore, the Average Abnormal return (AAR) and finally the cumulative average abnormal return (CAAR) of the shares were calculated. The researcher will test if these figures are significant, and if so, is it prior to the announcement, on the day of the announcement, or after the announcement day (Afego, 2013).

This method will be elaborated in detail in the following chapter, which discusses the research methodology followed in conducting this study.

## **2.6 Summary**

The chapter dealt with the literature review part of the study with discussions on the mining industry, the JSE and how capital markets react to earnings announcements. The literature on the different countries explored in this study indicates what the results of the research revealed. Table 2.5, below shows how the stock market, from the countries selected for the literature review, reacts to earnings announcement.



**Table 2.5: Summary of literature review on market reaction to earnings announcements**

<b>Author</b>	<b>Country</b>	<b>Method used</b>	<b>Findings</b>
Bartov <i>et al.</i> (2000)	United States NYSE	Event study	<b>Coefficient estimates, positive and significant;</b> Ordinary investors reacted positively on the event window period while institutional investors reacted negatively. This study suggests that institutional investors are more up to date with information on the events.
Alegria <i>et al.</i> (2009)	United Kingdom LSEG	Event study, single index model	<b>Higher than normal dispersion on the event day;</b> During the announcement day investors increased their trading activities.
Kong & Taghavi (2006)	China SZSE and SSE	Event study, EGARCH model	<b>Significantly influences the mean;</b> Trading on both stock exchanges increases days before the announcement and decreases days after the announcement.
Wang & King Phet (2012)	Nordic Countries OMX-NSE	Event study	<b>AAR insignificant during event window;</b> Trading during the event window had a lower impact on share price.
Afego (2013)	Nigeria NSE	Event study	<b>Negative abnormal returns around earnings announcements;</b> Investors could not benefit on the event window period.
Mlonzi <i>et al.</i> (2011)	South Africa JSE	Event study, Market model	<b>Negative price reaction to earnings announcements;</b> The share price on the ALtX, could not be influenced by the earnings announcement.

*Source: Author*

The above findings showed mixed results on different stock exchanges around the globe. The mixed results might be attributed to the sample sizes chosen by the different researchers or the event windows selected for the studies. This research attempts to breach the gap in literature on what impact earnings announcements have on the share prices of listed mining companies on the JSE.

The market reaction to earnings announcements forms the basis of the main objective of the study and sets out the tone for the rest of the chapters of this research. The following chapter deliberates on the research methodology applied in this study.

## Chapter 3

### Research methodology

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#### 3.0 Introduction

The previous chapter dealt with the literature surrounding the research topic. The studies reviewed indicate that a classical event study methodology seems to be the best option for this research study to test the impact of earnings announcements on share prices of mining companies listed on the JSE. This chapter describes the full layout of the methodology. It starts with the research paradigm followed by the research design and methods that are followed in this study.

The main objective of this study is to investigate the impact of earnings announcements on the share prices of selected mining companies listed on the JSE. This objective will be tested by implementing a classical event study methodology. A classical event study methodology is commonly used in finance literature to test the impact of certain events on share prices of companies affected by such events.

The chapter will give a detailed explanation of how the methodology used in the study will be applied to address the research objective. Furthermore, it will describe and discuss the research design that will be applied to accurately define, analyse and interpret the data collected.

The remainder of this chapter will be structured as follows: In sections 3.1 and 3.2 the problem statement and research objectives are stated. Sections 3.3 and 3.4 discuss the research paradigm and research design chosen for this study. The research method, sampling strategy and data collection are discussed in sections 3.5 to 3.7, including a full description of the event study methodology.

The hypotheses are stated in section 3.8 and section 3.9 give a detailed description of the method that will be used in the analysis of the data. The reliability and validity employed in this research are discussed in section 3.10. Section 3.11 presents the ethical considerations applied in the study. The limitations of this research are described in section 3.12 and section 3.13 gives a brief summary of the full chapter.

### **3.1 Problem statement**

The problem statement describes exactly why a study is being undertaken and what will be investigated in the study (Hofstee, 2006). The purpose of this study is to investigate the impact of earnings announcements on the share prices of all mining companies listed on the JSE.

Scholars and researchers have for many decades been interested in the impact of earnings announcements on the share price of a company (Afego, 2013; Mlonzi, *et al.*, 2011). This impact, although rigorously tested in developed countries (Ball & Brown, 1968; Fama *et al.*, 1969; Ball & Kothari, 1991; Booth *et al.*, 1997), has not been widely tested in developing countries.

This study specifically explores the impact of earnings announcements on the share prices of all mining companies listed on the JSE. The research is aimed at breaching the gap in literature that surrounds the earnings announcements on mining companies in developing markets.

### **3.2 Research objectives**

The research objective of this study is to test, by means of empirical study, the effect of earnings announcements on selected mining companies listed on the main board and the alternative board of the JSE. Thus, the aim of this study is to determine:

- the impact of earnings announcements on the share price of selected mining companies listed on the JSE.
- if there is an impact of the earnings announcement on the share prices of selected mining companies listed on the JSE, what is the size of the impact.
- if there is an impact of the earnings announcement on the share prices of selected mining companies listed on the JSE, what is the directionality of the impact, which means, does the share price increase or decrease?

### **3.3 Research paradigm**

Kuhn is regarded as the pioneer of the paradigm-concept (Cronjé & Coletto, 2015). The authors cite that a paradigm is established where there is an agreement between members of a scientific community about such a paradigm. Saunders, Lewis and Thornhill (2009) define the research paradigm as the way of examining social phenomena from which particular understandings and findings can be gathered and explained. In addition, Krauss (2005) asserts that a theoretical paradigm is used to identify the underlying basis that is used to construct a scientific investigation of a phenomenon.

The research paradigm followed by this study is a positivist approach using deductive reasoning. Positive accounting research claims to give reliable and empirically sustainable answers to questions that policy makers perceive to be important (Ryan, Scapens & Theobald, 2002). The positivist approach and deductive reasoning are elaborated on in the following sections.

#### **3.3.1 Positivism**

Maree (2009) defines positivism as an approach to social research that seeks to relate the natural science model of research to inquiries of social phenomena and explanations of a social world. Between 1860 and 1920, positivism was considered to be the dominant philosophy in the science field (Cronjé & Coletto, 2015). A positivist approach entails that the researcher is independent from the data obtained and does not become emotional with the collection or analysis of data and its results (Coetzee, 2014).

The following key concepts of positivism were highlighted by Maree (2009):

- Only objective and observable facts can be the basis of a scientific study; and
- These facts are those that can be explained by scientific laws and methodologies.

The advantages and disadvantages of a positivistic research approach as pointed out by Coetzee (2014) are presented in Table 3.1 below:

**Table 3.1: The main advantages and disadvantages of a positivistic research approach**

Advantages	Disadvantages
Suitable for research projects that require a structured and quantitative approach.	Highly structured research design imposes prearranged limits and boundaries to research.
It is good for research projects that are descriptive in nature.	Not a good approach to take if one is trying to explain why things happen.
Standardisation makes collation and codifying of gathered data easier.	Assumes that researchers can be totally objective, but researchers may allow their own values and interests to influence the approach.
Research methods are easier to reproduce and for other researchers to test your conclusions.	It is very difficult to capture the complex interplay of phenomena in a single measure.
	Researchers need to use a large sample to be able to make generalisations from the results.

Source: Coetzee (2014)

### 3.3.2 Deductive reasoning

Deductive reasoning is thought to be moving from the general assumptions to the specific assumptions (De Vos *et al.* 2014). Newman (2006) [as cited in De Vos *et al.* 2014] posits that to theorise in a deductive direction, researchers begin with abstract concepts outlining the logical connection among propositions and finally move towards concrete empirical evidence.

Saunders *et al.* (2009) list five stages that a deductive reasoning approach will sequentially follow. The authors indicate that a hypothesis has to be deduced first by examining previous theories. Secondly, the researcher expresses the hypothesis in terms of a relationship between variables. Furthermore, the hypothesis has to be tested

and the results relating to the hypothesis must be interpreted. Finally, the theory has to be modified based on the findings where necessary.

The above-mentioned stages were followed in this study, in collaboration with the research design and research method in order to achieve the research objectives and answer the research problem. The next section will address the descriptive research method.

### **3.3.3 Descriptive and explanatory research**

Saunders *et al.* (2009) define descriptive research as a research method used to describe certain events or phenomena. It presents a picture of specific details of a situation or phenomenon whether in a social setting or relationship. The questions asked by researchers focus on "how" and "why" (De Vos *et al.* 2009). This type of research is commonly used in conjunction with explanatory research which is said to establish the relationship between variables (Saunders *et al.*, 2009).

Explanatory research uses quantitative data to numerically interpret a relationship between variables, but also uses qualitative data to explain the reasons for the relationship. Studies conducted using this method are called descripto-explanatory (Saunders *et al.*, 2009). This study followed elements from both descriptive and explanatory research to investigate the impact of earnings announcements on the share prices of mining companies listed on the JSE. The research design of this study is explored in the next section.

## **3.4 Research design**

According to Creswell (2009), research design is defined as a plan and procedure for research that span the decisions from broad assumptions to detailed methods of data collection and analysis. It involves the intersection of philosophical assumptions, strategies of inquiry and specific methods. Saunders *et al.* (2009) contend that research design will contain clear objectives obtained from the research questions. Mouton (2005) further explains a research design as a blueprint or plan on how a researcher intends conducting research.

The research problem in this study states that the research is being conducted to fill the gap that currently exists in literature relating to the impact of earnings announcements on the share prices of mining companies listed on the JSE. The research design chosen in this study aims at contributing to the above problem. The research design was chosen on the basis that the study undertaken is based on the observations made during the event period.

The research design followed in this study can be described as a quantitative research methodology using secondary data. De Vos *et al.* (2014) identified, among others, the following characteristics of a quantitative research approach. The authors comment that this method is used to answer questions about relationships among measured variables with the purpose of explaining, predicting and controlling phenomena.

The intent is to establish, confirm or validate relationships and to develop generalisations (De Vos *et al.*, 2014). Furthermore, the authors point out that quantitative researchers isolate the variables they want to study, control for extraneous variables, use a standardised procedure to collect some form of numerical data, and use statistical procedures to analyse and draw conclusions from the data.

Studies using a quantitative approach usually end with confirmation or disconfirmation of the hypotheses that were tested. Finally, as emphasised by De Vos *et al.* (2014), quantitative researchers tend to rely more heavily on deductive reasoning (moving from the general to the specific), beginning with certain premises (e.g. hypotheses, theories) and then drawing logical conclusions from them.

Principles relating to descriptive and explanatory research are also incorporated in this research as explained in the preceding section. The following section will elaborate more on the applicability of quantitative data analysis.

### **3.4.1 Quantitative data analysis**

Quantitative data analysis is normally used in descripto-explanatory research to find solutions to a particular phenomenon (Saunders *et al.*, 2009). This study employed quantitative research methods to address the objectives listed on section 3.2. In their raw form, data mean little and must be processed using quantitative analysis methods



to be able to interpret it (Saunders *et al.*, 2009).

The data on the share price reaction of selected mining companies around the earnings announcement dates were quantitatively analysed by making use of descriptive statistics. Saunders *et al.* (2009) posits that secondary data is normally used alongside quantitative data analysis while applying descripto-explanatory research. The following section highlights the advantages and disadvantages of using secondary data.

### **3.4.2 Secondary data**

Secondary data sources are defined by De Vos *et al.* (2014) as material that is derived from someone's previous work or original source. Saunders *et al.* (2009) concur with De Vos *et al.* (2014) and posit that the researcher reanalyses data that have already been collected for some other purpose. This study made use of secondary data in order to address the research objective.

Data were collected from the JSE database and the INET BFA website. INET BFA is one of Africa's leading providers of accurate and timely financial data feeds and analysis tools. The data were analysed using secondary data analysis tools in order to test the hypothesis and validate the models used. The market model was used in this study and is discussed in section 3.5.4. Using secondary data sources has its own successes and failures and these will be discussed in the following sections.

#### **3.4.2.1 Advantages of secondary data**

The advantages of using secondary data as demonstrated in the work of Saunders *et al.* (2009) indicate that secondary data in its form may have less resource collection requirements than primary data, and that there is less time consumed during the data collection period. In addition, the information is kept safely and is generally permanent in nature. When using secondary data, researchers may come up with new discoveries. The authors assert that the researcher's findings can be placed in a general context and secondary data may have fewer time constraints than primary data.

As opposed to the advantages of using secondary data cited above, there are also disadvantages encountered when conducting a research project using secondary data. The disadvantages of using secondary data will be discussed in the following section.

### **3.4.2.2 Disadvantages of secondary data**

De Vos *et al.* (2014) outline the disadvantages of using secondary data. The disadvantages elaborated by the authors as well as how they are minimised in this study will be summarised below.

The data used in this research were collected to track and analyse conditions in the market during the period of the study. However, De Vos *et al.*, (2014) posit that there is sometimes a mismatch between the data and the purpose of the study being conducted. In addition, the authors indicate that access to the data sources may be difficult and there is no real control over the quality of the data used.

This research used data acquired from INET BFA, which is considered to be Africa's leading provider of financial data and analysis tools (INET BFA, 2016). Firstly, the data from INET BFA were used to track the share movements around earnings announcements. Secondly, the JSE Stock Exchange News Service (SENS) database was used to access company information relating to the publication of their financial results. The JSE data source is deemed to be South Africa's most reliable market related data source (JSE, 2015).

## **3.5 Research method**

According to Creswell (2009), research methods represent the third major element that involves data collection, analysis and interpretation. These methods can be divided into quantitative, qualitative and/or mixed methods. This study will follow a quantitative event study methodology in collecting data. Dolley (1933) originally implemented the event study methodology in finance theory.

### **3.5.1 The classical event study methodology**

An event study is a statistical technique that estimates the share price impact of occurrences such as mergers, earnings announcements and so forth (Corrado, 2011). The basic notion is to separate the effects of two types of new information on share prices. First, information that is specific to the company under consideration (e.g. dividend announcement). Second, information that affects the market in general (e.g. change in interest rate).

Among the first event studies known today are research works by Ball and Brown (1968), followed immediately thereafter by Fama *et al.* (1969). However, these were not the first cases of event studies conducted in finance and accounting literature. MacKinlay (1997) indicates that Dolley (1933) conducted the first published study that applied the event study methodology. The work of Dolley (1933) investigated the effects of stock splits on share prices by examining 95 stock split events for the period 1921 to 1931.

Over the past decades, event studies have contributed immensely to research in the capital markets literature (Corrado, 2011). MacKinlay (1997) and Corrado (2011) claim that event studies have not only been a successful research method in finance, but also in other disciplines.

Coetzee (2014) cites that the classical event study methodology follows the calculation of abnormal returns of a security within a certain event window. Sawyer and Gygax (2001) states that in a standard event study, the uniqueness of event “i” is measured by the deviation of the abnormal return of event “i” from the mean abnormal return across each day of the event period.

Nineteen (19) years ago, MacKinlay (1997) reported that there are 10 steps to be followed in an event study. These steps are outlined as follows:

- The researcher first starts by choosing an event for the study;
- The event window should be finalised;
- The sample set of firms to be incorporated in the analysis must be selected;
- During the event window, conflicting events should be eliminated;
- Issues relating to time in event studies must be clarified;
- Estimation of a “normal” return surrounding the event window in the nonexistence of the incident;
- In the inference period, the parameter should be calculated;
- For all companies in the sample compute the estimate errors (find the variance/covariance details) for the event window, and make inferences about the average impact;

- Abnormal returns should be tested for their significance on the results; and
- The excess returns on appropriate or unique firm characteristics are computed after conducting cross-sectional regressions.

As explained in the first step mentioned above, an event has to be recognized in order to carry out a study of this nature. The following section deals with an identification of an event.

### **3.5.2 An event**

Bodie, Kane and Marcus (2011) define an event study as a technique of empirical financial research that enables an observer to assess the effect of a particular event on a firm's share price. MacKinlay (1997) similarly defines an event study in finance literature as a method that measures the effect of a specific event on the value of a firm.

In this study, an event is identified as an earnings announcement made by mining companies listed on the JSE, where equity shareholding and ownership is affected. One of the rules governing JSE listed companies is that they must declare any material information that might have an impact on share prices to all shareholders through its Stock Exchange News Service (SENS) (Sennanye, 2015).

### **3.5.3 Event window**

The event window as pointed out by Sennanye (2015) is the period where an actual event of interest occurs. It is the event occurrence day plus and/or minus some period of interest; this could be days, weeks or even months during which the returns of selected firms are studied (Henderson, 1990) and applied consistently. This is done to examine whether their results from the analysis are abnormal.

There is a relationship between the nature of the news released and the resulting Cumulative Abnormal Returns (CAR) as expressed by MacKinlay (1997). He found that "bad" news results in negative CAR by causing the share prices to decrease, while "good" news results in a positive CAR that causes the prices to increase.

This study followed the classical event study method of calculating the daily returns and abnormal returns of each security within the inclusive sample of selected mining

companies listed on the JSE. The 25 day symmetrical event window surrounding the earnings announcement day, which is 25 days before the earnings announcement and 25 days after the earnings announcement, will be used. The days were chosen to ensure that the study can determine normal market returns and capture the possible event reaction.

Sorokina, Booth and Thornton Jr. (2013) maintain that high-frequency event studies have been in use since the 1980's, where analysis were performed on 15, 30 and 60 minutes' returns as well as overnight returns. However, the authors suggest that there is no uniform agreement on the estimation period.

Although event studies have increased in popularity over the past four decades within many disciplines, it is also prone to problems like any other method in use today (Corrado, 2011). Some of the advantages and disadvantages experienced by this method are listed below.

#### **3.5.3.1 Advantages of event study methodology**

According to Spais and Filis (2008), the advantage of using event study methodology is that the usefulness of event studies arises from the fact that the magnitude of abnormal returns at the time of an event provides a measure of the anticipated impact on the shareholders' wealth. In addition, the authors posit that event studies are considered to be an important tool in capital market research as a way of testing market efficiency. Finally, they feel that event studies focusing on the short-time horizon around the event period is relevant for understanding corporate policy decisions (Spais & Filis, 2008).

#### **3.5.3.2 Disadvantages of event study methodology**

Spais and Filis (2008) also cite the following disadvantages of using event study methods. The event study method is used to examine the impact of managerial decision-making on certain events. It remains difficult and necessary to ensure whether the results have been reported clearly, and whether the interpretation of the results has been appropriate.

The effectiveness of the event study methodology is generally dependent on strong

assumptions. If these assumptions are violated, the empirical results may be biased and inaccurate, and therefore basing the conclusions on these assumptions can be problematic. Lastly, the results of the study depend on how the research is structured and designed. Therefore, it is possible that some theories have been unjustifiably supported because of inappropriate techniques used (Spais & Filis, 2008).

The next section introduces the model that was used in this research to find the results in order to contribute to the research problem.

#### **3.5.4. The market model and event studies**

Sharpe (1964) first introduced the market model and it is the most commonly used risk adjusted return estimation when adopting an event study methodology. Sennanye (2015) provides that event study is normally based on estimating a market-related return for a company before and after a specified event. This involves calculating abnormal returns for a specified period, before, during and after the event that is under consideration.

Coetzee (2014) concurs that when estimating the reaction of security prices around certain events, the market model is still the most widely used risk adjusted return estimator in event studies. Some of the studies using these methods include research conducted by Fama and Macbeth (1973); Fama (1998); Fama and French (2004); Chordia and Shivakumar (2006); Afego (2013); Mlonzi *et al.* (2011) and Wang and King Phet (2012).

Although this method is considered popular among researchers, some scholars still discredit the accuracy of this measuring instrument (Jordan & Jordan, 1991). Some authors argue that the market model is mis-specified and not the most accurate indicator of the risk adjusted returns (Coetzee, 2014).

However, when estimating abnormal returns during the event window, the market model is more widely used in empirical research (Afego, 2013). According to MacKinlay (1997), the assumptions of this model are statistically and empirically reasonable. Corrado (2011) is also of the opinion that the market model is useful in adjusting the event date returns to remove the influence of the overall market. The sampling strategy

for this study is discussed in the next section.

### **3.6 Sampling strategy**

In this study, the sample consists of all mining companies listed on the JSE; this includes companies registered on both the main and alternative board of exchanges.

#### **3.6.1 Target population**

De Vos *et al.* (2014) define target population as the population frame that includes persons, events, organisation units, case records or other units with which the research problem is concerned. This study will focus on all mining companies listed on the JSE (main and alternative boards). The population of all mining companies was 67 in October 2015 (INETBFA, 2015). The sample was selected from all 67 mining companies listed on the JSE from the beginning of January 2011 to the end of December 2015.

#### **3.6.2 Sample selection**

The sample used is deduced by following a set of criteria and this is done in two different stages by the researcher. The sample criteria are as follows:

- The companies selected must form part of all mining companies listed on the JSE for the full period under consideration (2011-2015);
  - If a company was excluded either by not being listed or delisted during the period, the company is excluded from the sample.
- The company must have announced its annual earnings results each year for the period under examination (2011-2015);
  - If a company failed to declare/announce its earnings results each year for the period 2011-2015, that company is excluded from the sample.

Although the population of all mining companies was 67, after applying the criteria above, a final sample of companies to be used in this research is 27 companies.

Table 3.2 below represents all mining companies included in the final sample.

**Table 3.2: Listed mining companies in the final sample**

No	Company name	JSE Code
1	AFRICAN RAINBOW MINERALS LTD	ARI
2	ANGLO AMERICAN PLATINUM LTD	AMS
3	ANGLO AMERICAN PLC	AGL
4	ANGLOGOLD ASHANTI LTD	ANG
5	ASSORE LTD	ASR
6	DRDGOLD LTD	DRD
7	GOLD FIELDS LTD	GFI
8	HARMONY GOLD MINING COMPANY LTD	HAR
9	IMPALA PLATINUM HOLDINGS LTD	IMP
10	LONMIN PLC	LON
11	MERAFE RESOURCES LTD	MRF
12	NORTHAM PLATINUM LTD	NHM
13	TRANS HEX GROUP LTD	TSX
14	PETMIN LTD	PET
15	SENTULA MINING LTD	SNU
16	RANDGOLD & EXPLORATION COMPANY	RNG
17	BAUBA PLATINUM LTD	BAU
18	BUILDMAX LTD	BDM
19	BHP BILLITON PLC	BIL
20	EXXARO RESOURCES LTD	EXX
21	AQUARIUS PLATINUM LTD	AQP
22	WESCOAL HOLDINGS LTD	WSL
23	CHROMETCO LTD	CMO
24	PAN AFRICAN RESOURCES PLC	PAN
25	ROCKWELL DIAMONDS INCORPORATED	RDI
26	KEATON ENERGY HOLDINGS LTD	KEH
27	ROYAL BAFOKENG PLATINUM LTD	RBP

**Source:** Author

### 3.7 Data collection

Data collection is described as the precise and systematic gathering of the information needed to address a research problem (Mphuthi, 2010). Therefore, the method must be relevant to the research purpose or the specific objectives and questions. This study will follow the event study methodology to conduct this research. This is a standard approach used in this kind of study as established by Fama *et al.* (1969).

This study will use secondary data collected directly from the JSE and the INET BFA databases. Both these data sources are considered to be among South Africa's most trusted sources for economic and financial data feeds. The use of these two reliable sources justifies the validity and reliability of the data collected. Validity and reliability of this study will be discussed in section 3.10.



### 3.7.1 Data to be collected

This study will use three sets of data in order to address the objectives set in section 3.2. The first data set consists of all mining companies listed on the JSE during the research period. Secondly, data of dates during which earnings announcements were made public on SENS. Lastly, data regarding the daily closing share prices of companies within the sample obtained from INET BFA.

- The first data that need to be collected is all the mining companies that were listed on the JSE for the period 2011-2015;
- After collecting the data of the companies in the sample, the earnings announcement dates were collected for each company within the sample for each year (2011-2015) under investigation.
  - The companies that did not publish their earnings results for the period mentioned above will be excluded in the study.
- The final data set collected for each company in the sample, comprise of the daily closing prices surrounding a 25 day event window ;
  - The daily closing prices of the shares for each company within the sample set will be collected for 25 days before the earnings announcement date, the day of the announcement and 25 days after the announcement date.

### 3.8 Hypothesis

According to Kumar (2005), a hypothesis is considered to be any assumption that a researcher seeks to validate through an enquiry. Furthermore, Saunders *et al.* (2009) confirm that a hypothesis is a testable proposition stating that there is a significant difference or relationship between two or more variables.

Kumar (2005) provides the following characteristics of a hypothesis:

- A hypothesis should be conceptually clear, simple and specific;
- It should be capable of verification and modification;
- It should also be related to the existing theory and body of knowledge; and
- A good hypothesis should be operationalisable to the subject investigated.

In order to meet the research objectives of this study, hypotheses need to be formulated

and tested. The hypotheses used in this study tested whether the earnings announcements of company's results will have a significant impact on the share price of selected mining companies listed on the JSE.

When applying a classical event study, the impact on the share prices is measured based on the abnormal returns (AR) obtained after the event has taken place. When making a correct assumption that the earnings announcements will have an impact on the share prices of all mining companies listed on the JSE, an abnormal return effect has to be present.

The null hypothesis to be proved or disapproved is that the mean abnormal return in the period surrounding the event day is equal to zero. A mathematical presentation of the hypotheses is provided below:

**H<sub>0</sub>:** Abnormal returns obtained on the earnings announcement event window period will not be significantly different from zero.

**H<sub>1</sub>:** Abnormal returns obtained on the earnings announcement event window period will be significantly different from zero.

### **3.9 Data analysis**

Data analysis involves breaking up the data into manageable themes, patterns, trends and relationships (Mouton, 2005). In this study, three sets of data were used. The first set of data comprises all mining companies listed on the JSE during the period 2011-2015. The second set is the earnings announcement day for each of the constituent companies; that is the day the board of directors announces/publishes the company's financial statements. The final set is the daily closing prices of the respective companies over the chosen time-periods.

The third data set consisting of the daily trade prices of the respective companies, will be collected for a period of 25 days before the earnings announcement, the earnings announcement day (0) and 25 days after the announcement. This raw data were then converted into daily returns, Abnormal daily Returns (AR), Average Abnormal Returns (AAR), and Cumulative Average Abnormal Returns (CAAR). The researcher used Excel spreadsheets to analyse the results.

In this study, the market model will be used to measure the returns of the shares related to the market movement. Sharpe (1964) developed and suggested the market model. An Excel spreadsheet will be used to capture data and analyse it using the statistical tools such as test statistics (t-statistics) and probability values (p-values). These tools will be used in this research to approve or disapprove the hypotheses formulated in chapter one.

Sharpe's model is expressed mathematically as:

$$E_{R_{it}} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

For  $i = 1 \dots n$

Where:  $E_{R_{it}}$  = Expected return on security "i" during time period "t";

- $\alpha_i$  = Intercept of a straight-line or alpha coefficient of  $i^{\text{th}}$  security;
- $\beta_i$  = Slope of a straight-line or beta coefficient of  $i^{\text{th}}$  security;
- $R_{mt}$  = Expected return for the market portfolio during period "t"; and
- $\varepsilon_{it}$  = Error term with a mean zero and a standard deviation which is a constant during time period "t".

## Abnormal Return (AR)

For the market model parameters  $\alpha_i$  and  $\beta_i$  were calculated using regression analysis. Due to assumptions inherent to the market model,  $\varepsilon_{it}$  has an expected value of zero; therefore, the following simplified model of regression was used for estimating the returns on each security by taking the actual returns on the market,  $R_{mt}$ .

$$E_{R_{it}} = \alpha_i + \beta_i R_{mt}$$

The abnormal returns (AR) are computed using the following model:

$$AR_{it} = e_{it} = R_{it} - E_{R_{it}}$$

Where:

$R_{it}$  = Actual returns (computed on the daily closing prices of each share)

In this study, the assumption is that  $\alpha_i = 0$  and  $\beta_i = 1$ ; therefore; the above equation is simplified as follows (Strong, 1992):

$$AR_{it} = R_{it} - R_{mt}$$

## Average Abnormal Return (AAR)

The abnormal returns of an individual security are averaged for each day surrounding the event day, that is, 25 days before and 25 days after the event day. The AAR is the average deviation of actual returns of a security from the expected returns. The following model is used for computing the average abnormal returns (AAR's):

$$AAR_{it} = \sum AR_{it} / N$$

Where:

- **I** = the number of securities in the study;
- **N** = total number of securities (companies) in the portfolio; and
- **t** = the days surrounding the event day.

Since the security's overall reaction to the earnings announcement (or the event) will be captured instantaneously in the behaviour of average abnormal return for one specific day, it is necessary to accumulate the abnormal returns over a long period. It gives an idea of the average share price behaviour over time.

### **Cumulative Average Abnormal Return**

Generally, if the market is efficient, the Cumulative Average Abnormal Return (CAAR) should be close to zero. The formula used to calculate CAAR is:

$$CAAR_{it} = \sum AAR_{it}$$

Where  $t = -25, -24, -23, \dots, -3, -2, -1, 0, +1, +2, +3, \dots, +23, +24, +25$

The Cumulative Average Abnormal Return (CAAR) for each security is obtained by summing abnormal returns (ARs) over the event window. To obtain the cumulative mean abnormal return, the researcher aggregated the CAARs and then tested for statistical significance using a t-statistic.

Corrado (2011) postulates that the common assumption used in the test of statistical significance surrounding the results obtained, is that when applying a classical event study methodology, the abnormal returns are normally distributed around the event period. To test the null hypothesis stated earlier in this chapter, a test of statistical significance was applied to the results of the abnormal returns and cumulative average abnormal returns.

### **Test for statistical significance**

The test for statistical significance is as follows:

**Abnormal return (AR);  $t = AR/SD(AR)$**

**Cumulative Average Abnormal return (CAAR);  $t = CAAR/SD(CAAR)$**

Where:

**SD** = represents the standard deviation.

### **3.10 Validity and reliability of data**

The most important aspect of the research project, regardless of what is being studied, is the validity and the reliability of the data used in the study. If the data used are not reliable and valid, the findings obtained from that study are inevitably invalid and questionable.

#### **3.10.1 Validity of measurement**

Saunders *et al.* (2009) define validity of measurement as the extent to which a scale or instrument measured what it is intended to measure. This study focused only on the events taking place 25 days before the announcement day, the day of the announcement and 25 days after the announcement day. There were no other external influences considered except as explained in the previous section (section 3.7.1).

The measurement instrument used in this study is a classical event study. This measurement tool has been used frequently (Bartov *et al.* 2000; Kong & Taghavi, 2006; Alegria *et al.* 2009) to test the impact of certain events on the share prices. To measure the impact of earnings announcements on the share price of all mining companies listed on the JSE, a classical event study method was used as a measuring instrument. By examining studies in the literature review (section 2.4) of this study, the validity of the measurement tool used tested what it is intended to test.

#### **3.10.2 Validity of data**

Kumar (2005) describes validity as the degree to which the research has measured what it has set out to measure. The data used in this study must produce findings that correlate with the intent of the study. There are different threats to the validity of the data collected (Saunders *et al.*, 2009).

These threats include among others the following:

- History;
  - Data collected may still possess information relating to a previous event.

- This may cause bias to the data and lead to misinterpretations of the findings.
- Testing;
  - Testing methods may be influenced by the opinion of the researcher.
 

The tests used in this study were conducted in a completely objective manner; free from the researcher's bias.
- Instrumentation;
  - The research instrument should test what it is intended to test.
 

This study focusses on testing the impact of earnings announcements on the share price of all mining companies listed on the JSE only.

### **3.10.3 Reliability**

Reliability is described as results which are consistent with the data collected (Maree, 2009). Saunders *et al.* (2009) identify four threats to the reliability of data collection methods:

- Subject or participation error;
- Subject or participation bias;
- Observer error; and
- Observer bias.

Since reliability relates to the collection of data, the above-mentioned threats are more applicable to primary data collection than secondary data collection. The data collected for the purposes of this study is secondary in nature, and is sourced directly from the JSE and INET BFA databases. Based on the previous sentence, all data collected for this project is reliable and suitable for the study undertaken. Therefore, its reliability cannot be taken into question.

This section discussed the reliability and validity of data used in this study. The following section investigates the ethical considerations the researcher must implement to ensure the validity and reliability of the findings.

### **3.11 Ethical considerations**

Saunders *et al.* (2009) define research ethics as the appropriateness of the researcher's behaviour in relation to the rights of those who become the subject of a

research project, or who are affected by it. It is of the utmost importance that the research conducted is sound and morally defensible to the participants involved (Coetzee, 2014).

### **3.11.1 Data**

Ethical considerations relating to the accuracy and validity of the data collection are taken into account in this study. The following ethical considerations will be taken into consideration by the researcher:

- Objectivity in collecting data – the researcher in this study ensured that all of the data used in this study were collected accurately and fully;
- Avoid subjective researcher bias, that is the researcher must not be selective in terms of only using certain data. The researcher used all data applicable for this study.
- Fabrication of data – no data used in this research can be fabricated. All data used in this study is sourced from reliable sources (JSE, INET BFA), thus no data were fabricated in this study; and
- Data collected in this study were not misrepresented and the results and errors are reported with honesty.

### **3.11.2 Plagiarism**

A further ethical consideration is not to plagiarise any other person's work. Where any other person's work is used, it should be referenced in the correct manner. Any other work which is not referenced in this study is deemed to be the work of the researcher.

The next section in this chapter outlines the limitations present within this research. The study will further indicate how those limitations are overcome.

## **3.12 Limitations of the study**

The research focused on the impact of earnings announcements on the share price of selected mining companies listed on the JSE; the study does not test the impact on the entire market. By making use of selected mining companies listed on the JSE, it is



believed that inferences can be made about the South African mining industry as a whole.

The study does not seek to understand why earnings announcements might have an impact on the share prices of all mining companies listed on the JSE; it only seeks to determine if there is an impact, i.e. size and direction.

### **3.13 Summary**

The research design implemented in this study was chosen based on the ability of the method used to solve the research problem. This study undertakes a quantitative research method and uses secondary data. A classical event study methodology is adopted to analyse and test the data in order to solve the research problem. The next chapter presents a full data collection, analysis and investigation of results obtained after applying the abovementioned methodology.

## Chapter 4

### Data collection and analysis

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#### 4.0 Introduction

The previous chapter introduced the research methodology applied in this study. As mentioned from the first chapter, the aim of this research is to investigate the impact of earnings announcements on the share price of selected mining companies listed on the JSE. In order to achieve this aim, the event study methodology was found to be appropriate for this research.

The first set of data to be investigated is the results of the abnormal returns (AR) computations for each of the sample companies. The second data set examines the results relating to the average abnormal returns (AAR). The third data set calculates the cumulative average abnormal returns (CAAR). The results found on calculating AAR and CAAR are aimed at supporting the outcomes of the AR calculations.

This chapter will be presented as follows: section 4.1 covers the description of the sample that was analysed; section 4.2 describes the procedure followed in the analysis of the data. Sections 4.3, 4.4 and 4.5 encompass the results and descriptive statistics surrounding the calculation of AR, AAR and CAAR. The hypothesis formulated in the introductory chapter will be tested in section 4.6. The last section (section 4.7) contains the summary of the chapter.

#### 4.1 Description of the sample

The event study methodology adopted in this research was applied to the final sample reached by applying the criteria set in the previous chapter. The data used in this study consists of annual earnings data and share price data of the companies selected in the sample. The final sample consisted of 27 mining companies listed on the JSE with a total of 135 earnings announcement dates for the sample period of 1 January 2011 to 31 December 2015.

A list of sample companies and the earnings announcement dates are presented in Appendix E. Information relating to the share price movements can be found in

Appendix F. The event window of 51 days (25 days before the announcement, the announcement day and 25 days after the announcement) was chosen and applied to each of the companies in the final sample.

## **4.2 Analysis of data**

A standard event study methodology was adopted in this study to address the objectives of this research and answer the research question. The event study methodology follows a certain pattern of calculating abnormal returns (AR), average abnormal returns (AAR) and cumulative average abnormal returns (CAAR) in order to determine whether a certain event has an effect on the company's share price. Included in this chapter is the hypothesis testing used to answer the research question.

## **4.3 Analysis of abnormal returns (AR)**

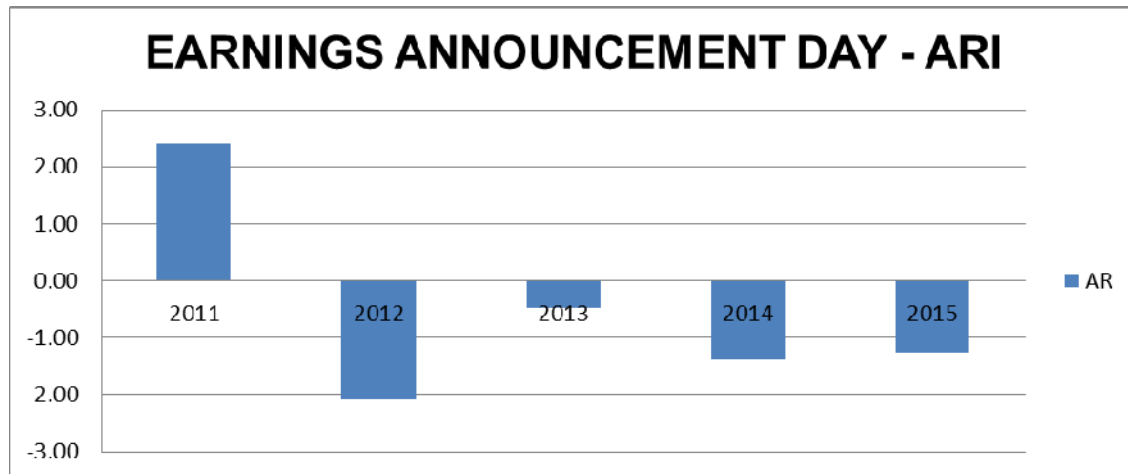
The first process followed to analyse data in an event study methodology is the calculation of abnormal returns surrounding the specific event. This process entails the calculation of expected returns using the market model introduced by Sharpe (1964). The market model has been discussed in detail in the previous chapter. In this research, the earnings announcement event is being explored.

The following sections present the results relating to the AR calculations for each of the companies in the sample. Each one of these companies is presented and discussed individually using bar charts to elaborate the results for the five-year sample period. All the companies listed on the JSE are identified by a code assigned by the stock exchange. The first company that will be analysed is African Rainbow Minerals bearing a JSE code of ARI.

### 4.3.1 African Rainbow Minerals (ARI)

The following section relates to the discussion of results surrounding the AR calculations obtained during the analysis of ARI. The AR obtained on the earnings announcement dates during the five year period of study extending from 2011-2015 is illustrated graphically in figure 4.1 presented below.

**Figure 4.1: Abnormal returns (AR) for ARI for the period 2011-2015**



**Source:** Author

As illustrated in the graphical representation (figure 4.1) above, the overall AR obtained by ARI was negative on the earnings announcement dates. However, the following years yielded interesting results:

- The AR obtained in the first year of study (2011) was positive; the yield in this period was 2.41%;
- There was a high negative AR response to earnings announcements of ARI especially in the years 2012, 2014 and 2015;
- In the years 2012, 2014 and 2015 ARI yielded an AR of -2.08%, -1.38% and -1.25% respectively on the earnings announcement dates; and
- ARI saw a minimal decline of AR for the year 2013, there was a negative abnormal return of -0.47% on the earnings announcement date.

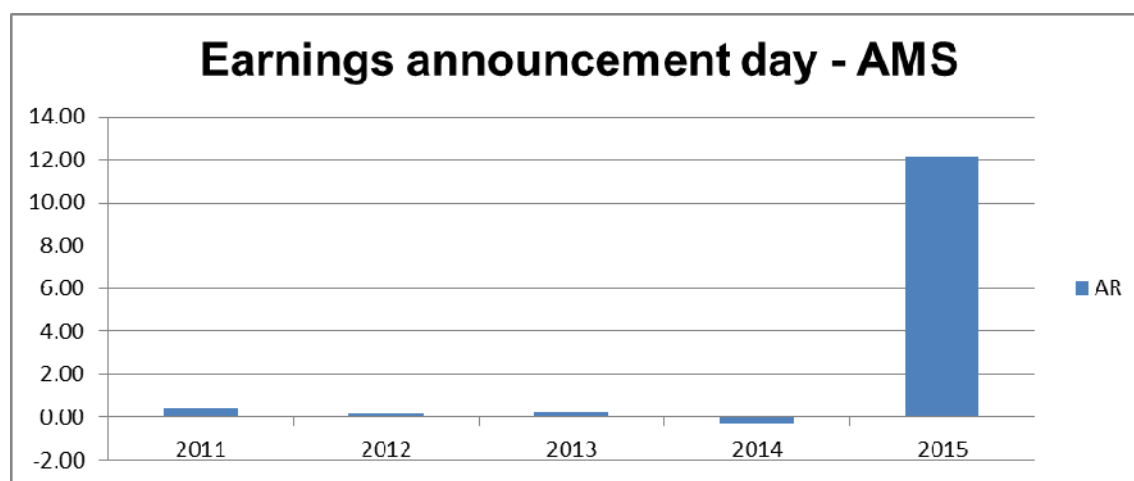
The results obtained for ARI during the calculation of AR for the five-year period indicated an overall negative trend on the earnings announcement dates. A graphical

representation of the AR results during a three-day event window surrounding the earnings announcement day is presented in figure 4.57 found in Appendix F.

### 4.3.2 Anglo American Platinum (AMS)

The results obtained during the period 2011-2015 for AMS abnormal returns are deliberated in the following section. The graphical presentation of these results shows a positive trend and is depicted in figure 4.2 below.

**Figure 4.2: Abnormal returns (AR) for AMS for the period 2011-2015**



*Source: Author*

The AR calculations in the above graph show an overall positive result of the share price movement on the earnings announcement dates. However, the positive movement was somehow insignificant in most years.

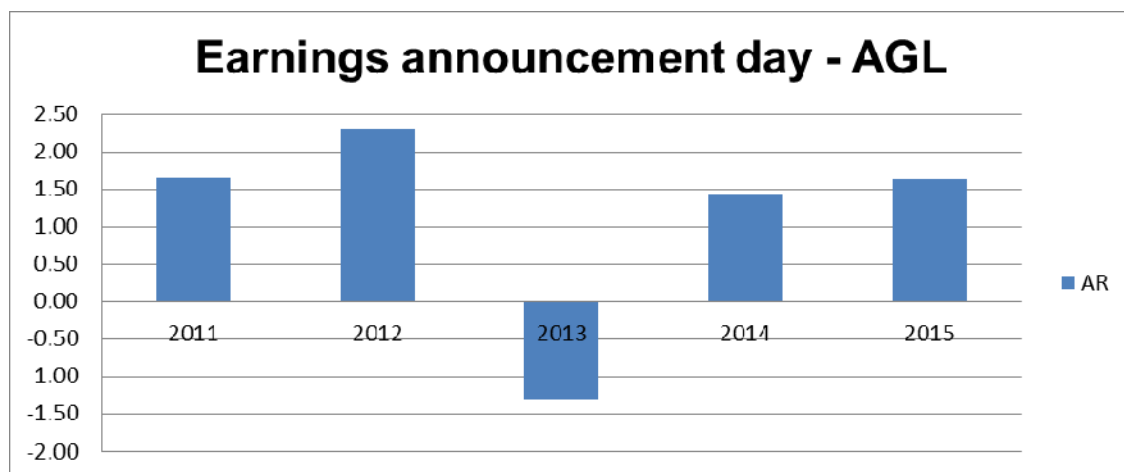
- The years 2011 to 2013 yielded the lowest positive AR results of 0.43%, 0.16% and 0.24% respectively.
- The abnormal returns on the earnings announcement day during 2015 reflected a high positive AR at 12.15%;
- However, the period covered in this study only show a negative AR during the earnings announcement day in 2014.
- The earnings announcement results in 2014 yielded a negative AR of -0.29%.

A graphical representation of the AR results during a three-day event window surrounding the earnings announcement day is presented in figure 4.58 found in Appendix F.

### 4.3.3 Anglo American plc (AGL)

The AR results for AGL on the earnings announcement date for the period 2011-2015 are graphically presented in figure 4.3 below.

**Figure 4.3: Abnormal returns (AR) for AGL for the period 2011-2015**



*Source: Author*

An overall positive trend in the results for AGL is depicted by the graphical representation above. The positive trend may be attributed to the size of the company. Anglo American plc is one of the top five (5) mining companies listed on the JSE in terms of market capitalisation (refer to table 2.1). The analyses of results are as follows:

- Four of the five years showed a similar trend of positive AR figures; in 2011 the figure was 1.64% and followed by the 2012 result of 2.30%. In 2014 and 2015 the results were 1.43% and 1.62 respectively.
- The results for 2013 were on the opposite side of the trend line, showing a surprisingly negative AR of -1.32%.

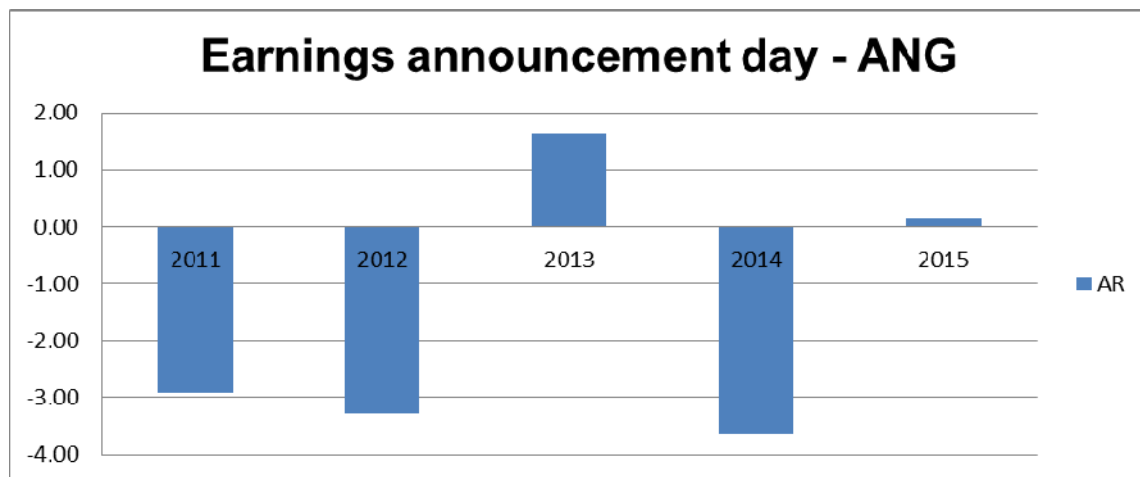
The negative movement on the AR for 2013 is consistent with the results for ARI above. A graphical representation of the AR results during a three-day event window

surrounding the earnings announcement day is presented in figure 4.59 found in Appendix F.

#### 4.3.4 AngloGold Ashanti (ANG)

The AR generated in the analysis of ANG on the earnings announcement day for the period 2011-2015 is presented in figure 4.4 below. The results indicated an overall negative AR on the earnings announcement date.

**Figure 4.4: Abnormal returns (AR) for ANG for the period 2011-2015**



*Source: Author*

Although the results obtained from the AR calculations on the earnings announcement day as illustrated in figure 4.4 above indicated an overall negative AR, the results still seem to be inconsistent. These inconsistencies will be discussed below.

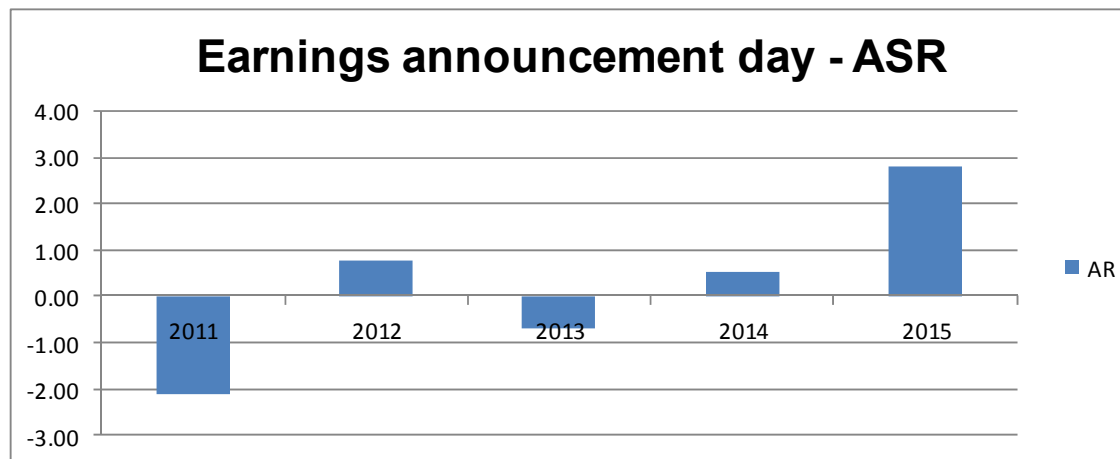
- The AR seemed to take an upward negative trend for the years 2011, 2012 and 2013;
- The calculations for these years yielded -2.92%, -3.29 and -3.63% respectively;
- A positive AR was realised only in 2013 and 2015;and
- These two years yielded an AR of 1.63% and 0.15% respectively on the earnings announcement dates.

A graphical representation of the AR results during a three-day event window surrounding the earnings announcement day is presented in figure 4.60 found in Appendix F.

#### 4.3.5 Assore Ltd (ASR)

The AR obtained during the analysis of results for ASR on the earnings announcement day for the period 2011-2015 showed an inconsistent trend, as graphically depicted in figure 4.5 below.

**Figure 4.5: Abnormal returns (AR) for ASR for the period 2011-2015**



*Source: Author*

The graph in figure 4.5 above indicated overall positive results. However, there is no consistency that can be seen in the results of other companies like AGL, AMS and ARI. The results of AGL and AMS portrayed an 80% positive trend while ARI showed an 80% negative trend. These findings are discussed below:

- The years 2011 and 2013 yielded the negative AR for the five year period;
- An AR of -2.12% was calculated in 2011 and in 2013 the result of the earnings announcement yielded -0.68%;
- The results for the years 2012, 2014 and 2015 were all positive; however 2015 yielded a higher AR; and
- The AR returns for these years were 0.77%, 0.53% and 2.79% respectively. The 2015 results coincide with the AR figures yielded by AGL and AMS.

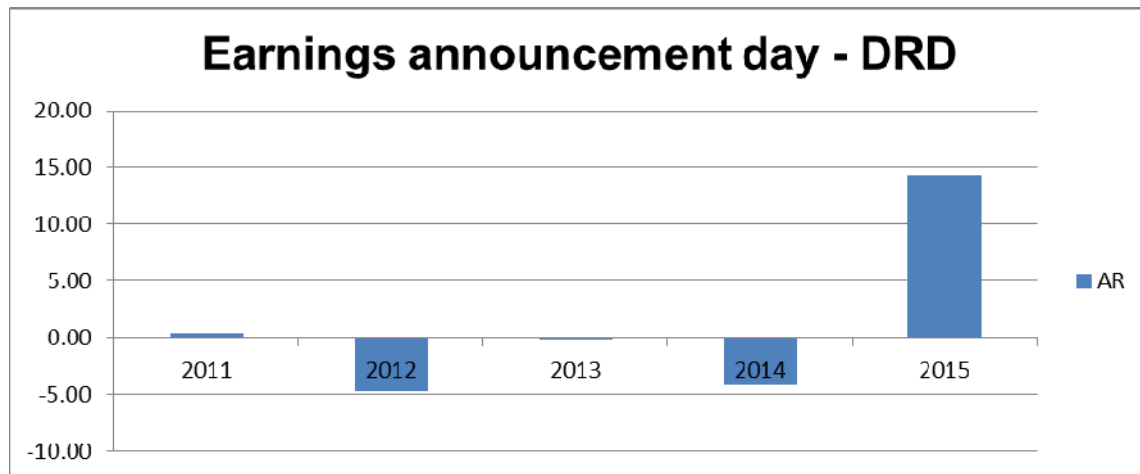
A graphical representation of the AR results during a three-day event window surrounding the earnings announcement day is presented in figure 4.61 found in Appendix F.



#### 4.3.6 DRDGold Ltd (DRD)

The results obtained in the calculation of AR for DRD will be discussed based on the graphical representation below. Figure 4.6 demonstrates the results obtained from the AR calculation on the earnings announcement date for the five-year period ranging from 2011-2015.

**Figure 4.6: Abnormal returns (AR) for DRD for the period 2011-2015**



*Source: Author*

As indicated in figure 4.6 above, the results pertaining to the AR calculation for DRD yielded inconsistent results of the impact of earnings announcements on the share price. The following years produced conflicting results:

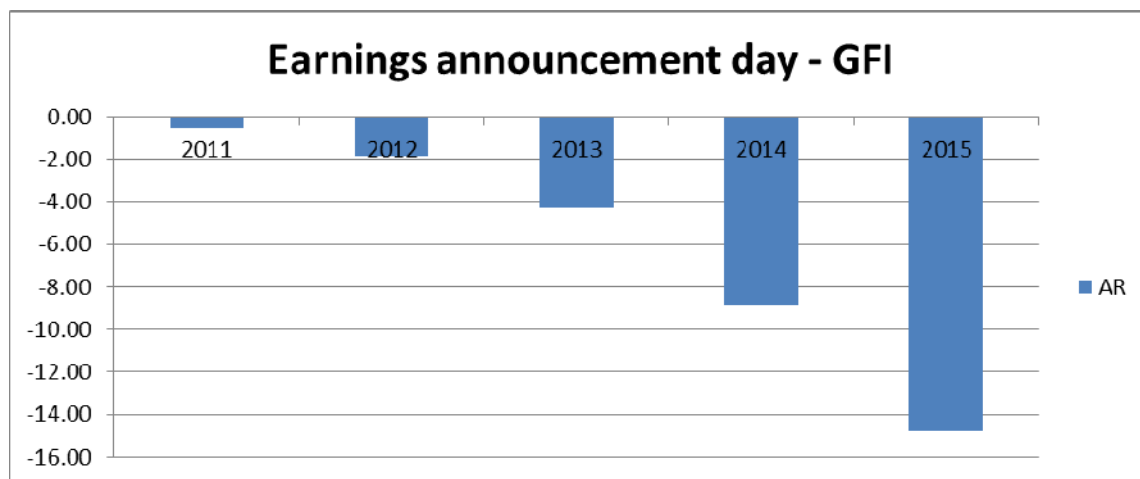
- The years 2011 and 2015 reflected the positive AR during the earnings announcement dates;
- The AR was 0.45% and 14.31% respectively. The highest AR was achieved in 2015 as reflected above. This is consistent with the AR for AMS, AGL and ASR in the same year;
- However, in 2012, 2013 and 2014 a negative AR was calculated for all three years; and
- The AR for this period was -4.66%, -0.13% and -4.15% respectively on the earnings announcement dates.

A graphical representation of the AR results during a three-day event window surrounding the earnings announcement day is presented in figure 4.62 found in Appendix F.

#### 4.3.7 Gold fields Ltd (GFI)

The AR on the earnings announcement date for GFI for the period 2011-2015 are illustrated in figure 4.7 below.

**Figure 4.7: Abnormal returns (AR) for GFI for the period 2011-2015**



*Source: Author*

The graphical representation of GFI results showed an overall negative trend. This indicates that for the full period of this study the market reacted negatively to the earnings announcements of GFI.

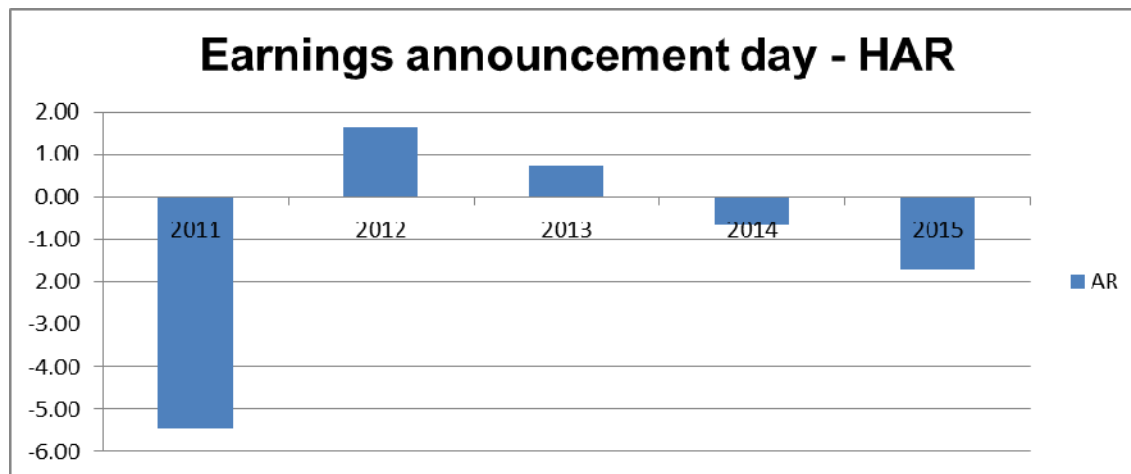
- The results depicted an interesting picture of a consistent negative increase in AR for all the years. This occurrence would be of interest to future market participants and needs to be investigated further.
- The calculation of AR provided the following, -0.52% (2011), -1.85% (2012), -4.27% (2013), -8.86 % (2014) and -14.77% (2015).

A graphical representation of the AR results during a three day event window surrounding the earnings announcement day is presented in figure 4.63 found in Appendix F.

#### 4.3.8 Harmony Gold Mining Company (HAR)

The AR calculated for HAR on the earnings announcement day for the period 2011-2015 is graphically illustrated in figure 4.8. These results pertaining to AR calculations will be discussed below.

**Figure 4.8: Abnormal returns (AR) for HAR for the period 2011-2015**



*Source: Author*

As illustrated in figure 4.8 above, the results pertaining to the AR calculated on the earnings announcement day for HAR were negative overall, yet they are still inconsistent. These inconsistencies include the following:

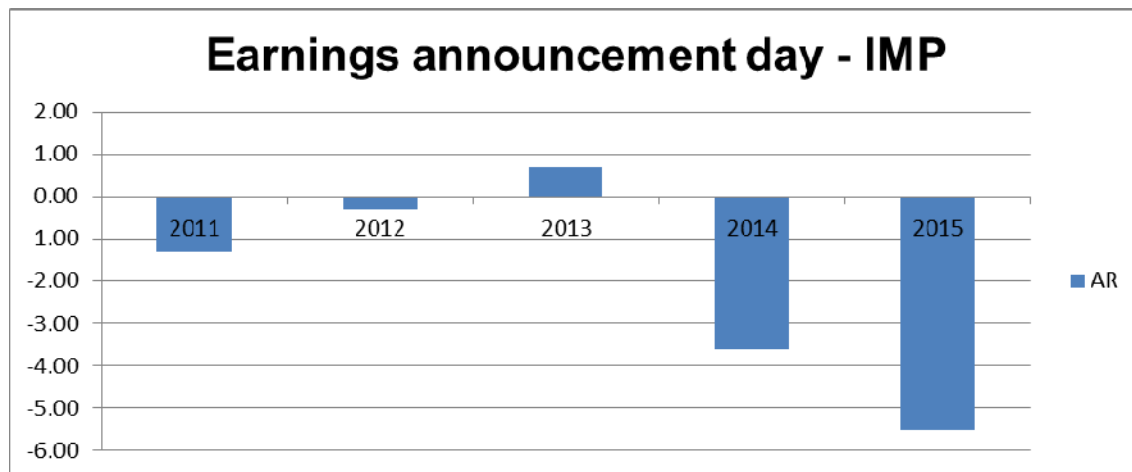
- The highest negative AR of -5.47% was obtained during 2011, whereas 2014 and 2015 revealed a moderate negative AR;
- The AR for these years was -0.68% and -1.72% respectively;
- Similarly the positive AR was portrayed for the years 2012 and 2013; and
- In 2012, an AR of 0.74% was achieved, followed by an AR of 0.68% for 2013.

These results are consistent with the results of the AR calculations obtained for ANG and DRD, but in contradiction with the findings for ASR. A graphical representation of the AR results during a three-day event window surrounding the earnings announcement day is presented in figure 4.64 found in Appendix F.

### 4.3.9 Impala Platinum Holdings (IMP)

The graphical illustration of results obtained from the AR calculation of IMP on the earnings announcement day for the period 2011-2015 presented in figure 4.9 will be discussed below.

**Figure 4.9: Abnormal returns (AR) for IMP for the period 2011-2015**



*Source: Author*

The results yielded from the AR presented in figure 4.9 show an overall negative response of share prices to earnings announcements. However, the following years presented interesting results:

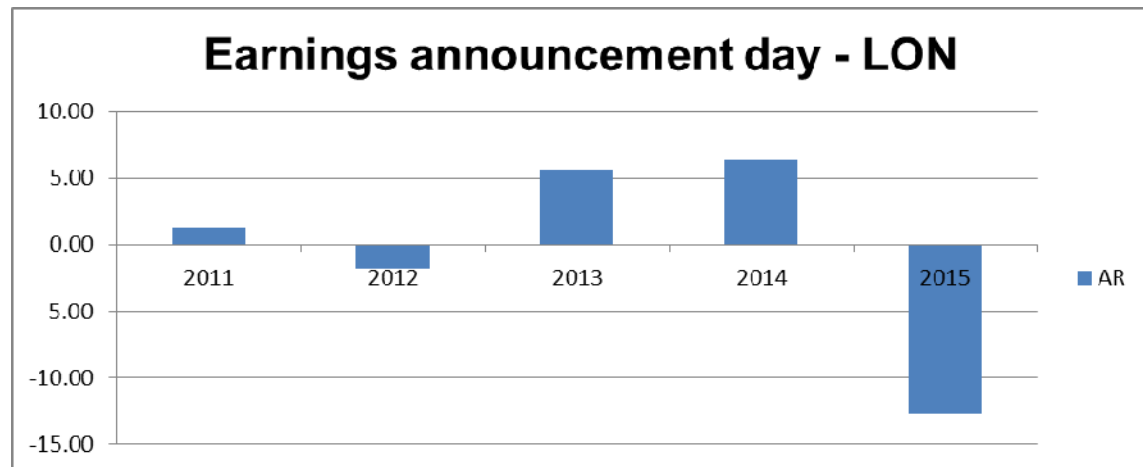
- The years 2012 and 2015 yielded the lowest (-0.30%) and the highest (-5.52%) AR for the period of the study;
- In 2011 and 2014, the negative yield was also evident in the results;
- The AR for the two years was -1.30% and -3.62% respectively; and
- The only year where IMP realised a positive result was in 2013, where an AR of 0.70% was achieved.

A graphical representation of the AR results during a three-day event window surrounding the earnings announcement day is presented in figure 4.65 found in Appendix F.

#### 4.3.10 Lonmin Plc (LON)

The AR acquired during the analysis of LON on the earnings announcement date for the five year period from 2011-2015 is graphically presented in figure 4.10 below.

**Figure 4.10: Abnormal returns (AR) for LON for the period 2011-2015**



*Source: Author*

The results presented in figure 4.10 above indicate an overall positive market reaction on the earnings announcement date. However, the results are mostly inconsistent. The following intriguing results were obtained:

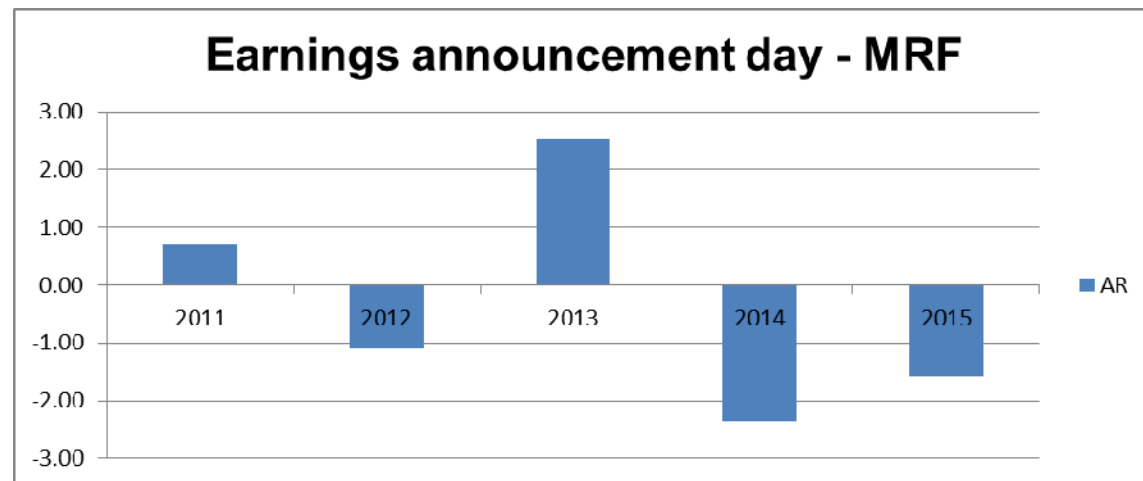
- The years 2011 and 2015 yielded the lowest and highest AR respectively for the five year period;
- In 2011, an AR of 1.34% was achieved. Conversely, in 2015, the highest AR of -12.71% was calculated on the earnings announcement date. LON was hit by a massive platinum wage strike in 2014 which could be linked to the huge negative AR for 2015; and
- Lonmin saw a negative AR in 2012 of -1.79%.

A graphical representation of the AR results during a three-day event window surrounding the earnings announcement day is presented in figure 4.66 found in Appendix F.

#### 4.3.11 Merafe Resources (MRF)

The AR calculation for MRF on the earnings announcement day for the period 2011-2015 is graphically illustrated in figure 4.11. These results relating to AR calculations are discussed below.

**Figure 4.11: Abnormal returns (AR) for MRF for the period 2011-2015**



*Source: Author*

As indicated in figure 4.11 above, the results pertaining to the AR calculation for MRF yielded inconsistent results of the impact of earnings announcements on the share price. The following years produced conflicting results:

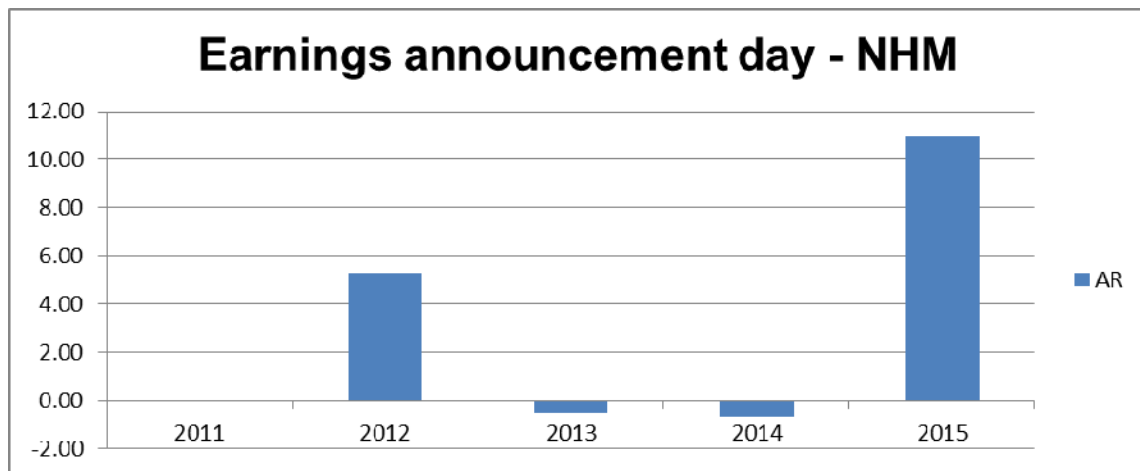
- The years 2011 and 2013 reflected a positive AR during the earnings announcement dates;
- The AR was 0.71% and 2.55% respectively. The highest AR was achieved in 2013 for MRF as reflected above.
- However, in 2012, 2014 and 2015 a negative AR was calculated for all three years. The AR for this period was -1.09%, -2.36% and -1.59% respectively on the earnings announcement dates.

The graph above shows a negative overall effect of the results of MRF for the period 2011-2015. These results are consistent with the AR results of DRD, HAR and ANG. A graphical representation of the AR results during a three-day event window surrounding the earnings announcement day is presented in figure 4.67 found in Appendix F.

### 4.3.12 Northam Platinum (NHM)

The results obtained in the calculation of AR for NHM will be discussed based on the graphical representation below. Figure 4.12 exhibits the results obtained from the AR calculation on the earnings announcement date for the five-year period ranging from 2011-2015.

**Figure 4.12: Abnormal returns (AR) for NHM for the period 2011-2015**



*Source: Author*

As illustrated in figure 4.12 above, the overall results pertaining to the AR calculation on the earnings announcement day for NHM were negative, yet there are still some differences. These differences include the following:

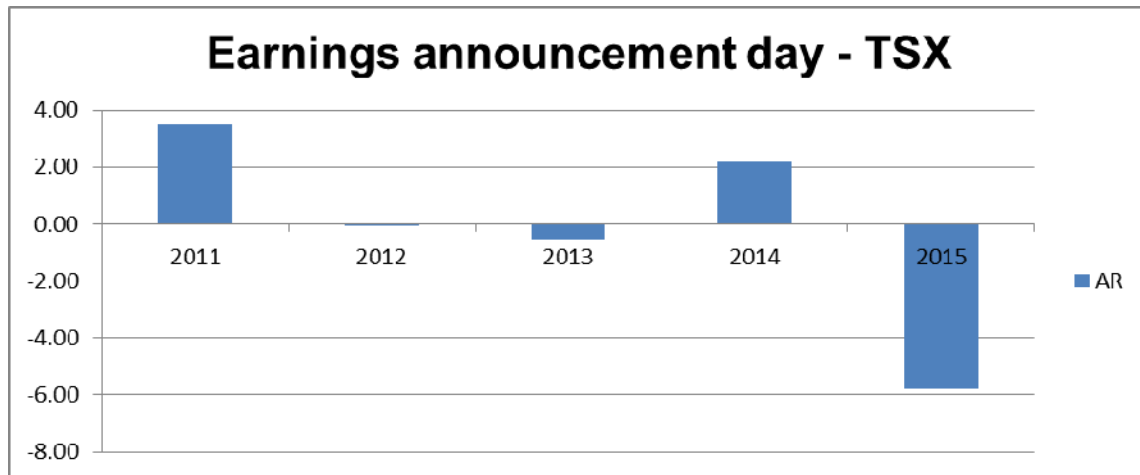
- The highest positive AR of 11.02% was obtained during 2015, whereas the results obtained during 2014 revealed the lowest negative AR of -0.65%;
- The AR calculations for the years 2013 and 2011 both indicated negative AR result of -0.50% and -0.01%, respectively; and
- In 2012, an AR of 5, 27% was achieved on the earnings announcement date.

A graphical representation of the AR results during a three-day event window surrounding the earnings announcement day is presented in figure 4.68 found in Appendix F.

### 4.3.13 Trans Hex Group (TSX)

The graphical illustration of results obtained from the AR calculation of TSX on the earnings announcement day for the period 2011-2015 is presented in figure 4.13 and will be discussed below.

**Figure 4.13: Abnormal returns (AR) for TSX for the period 2011-2015**



*Source: Author*

The results yielded from the AR presented in figure 4.13 above showed an overall negative market response to earnings announcements. However, the following years presented interesting results:

- The years 2012 and 2015 yielded the lowest (-0.07%) and the highest (-5.80%) AR for the period of the study;
- In 2011 and 2014 a positive yield was also evident in the results;
- The AR for the two years was 3.48% and 2.19% respectively; and
- The 2013 year realised a moderate negative AR of 0.51% for TSX.

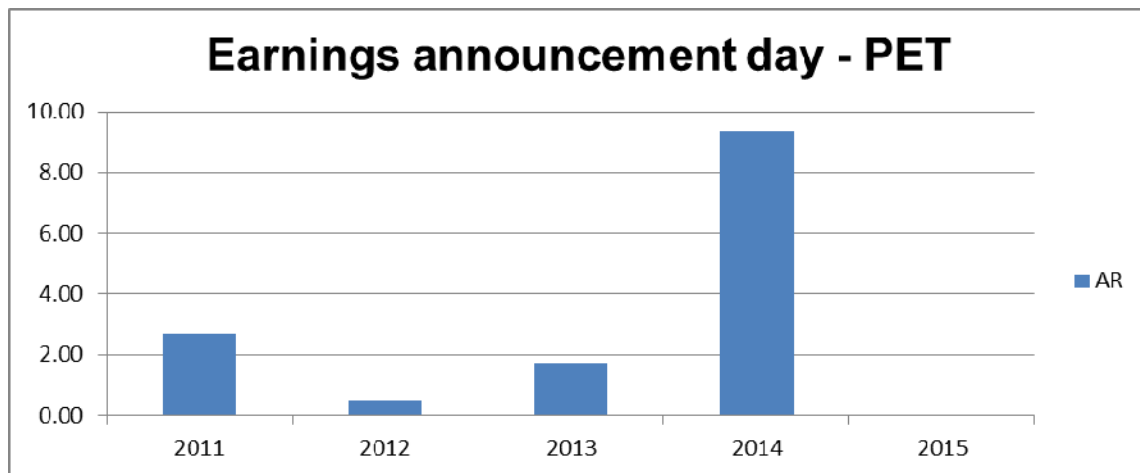
A graphical representation of the AR results during a three-day event window surrounding the earnings announcement day is presented in figure 4.69 found in Appendix F.



#### 4.3.14 Petmin Ltd (PET)

An overall positive result was obtained in the calculation of AR on the earnings announcement date of PET for the period 2011-2015. These results are graphically presented in figure 4.14.

**Figure 4.14: Abnormal returns (AR) for PET for the period 2011-2015**



*Source: Author*

Although an overall positive result was obtained for the AR calculation of PET, the results present some inconsistencies:

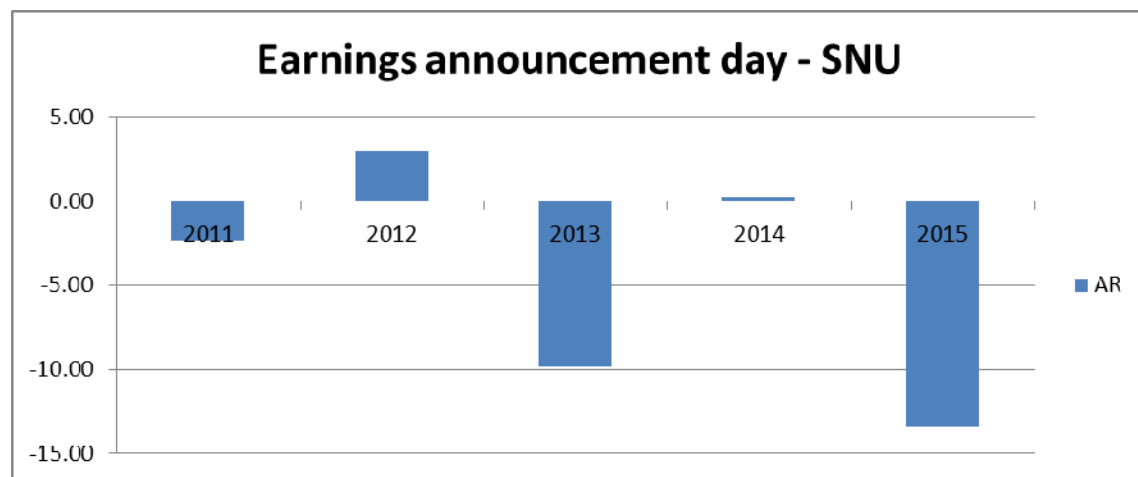
- The highest (9.38%) and the lowest (0.02%) AR was obtained in 2014 and 2015 respectively;
- There was a moderate positive AR achieved during 2011, 2012 and 2013; and
- An AR of 0.49% was achieved in 2012, and in 2013 the AR calculation yielded 1.73%, while lastly the 2011 figure was 2.68%

A graphical representation of the AR results during a three-day event window surrounding the earnings announcement day is presented in figure 4.70 found in Appendix F.

### 4.3.15 Sentula Mining (SNU)

The results pertaining to the AR calculation for SNU on the earnings announcement day for the period 2011-2015 are graphically presented in figure 4.15 and these results are discussed below.

**Figure 4.15: Abnormal returns (AR) for SNU for the period 2011-2015**



*Source: Author*

An overall negative AR was obtained in the analysis of SNU for the period 2011-2015. However, there are some inconsistencies present within these results. The most important of these inconsistencies include:

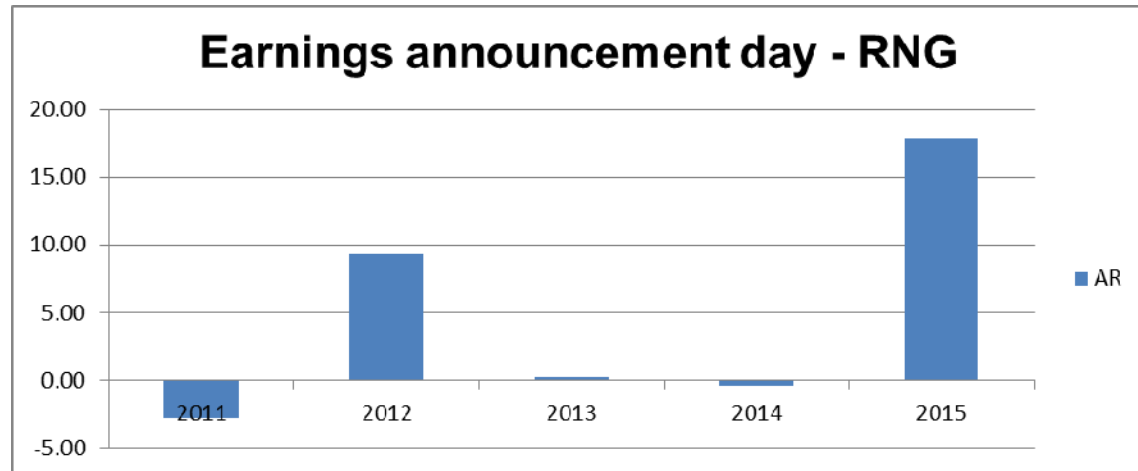
- The lowest AR of 0.23% was recorded in 2014.
- The highest AR of -13.46% was obtained in 2015, this is consistent with the AR results of GFI (-14.77%) and LON (-12.71%).
- Similarly, 2011 and 2013 saw a negative AR of -2.36% and -9.82% respectively; and
- The company only realised a moderate positive AR during 2012 at 2.98%.

A graphical representation of the AR results during a three-day event window surrounding the earnings announcement day is presented in figure 4.71 found in Appendix F.

### 4.3.16 Randgold and Exploration Company (RNG)

The AR obtained during the analysis of RNG on the earnings announcement day for the period 2011-2015 showed mostly positive results, as graphically presented in figure 4.16 below.

**Figure 4.16: Abnormal returns (AR) for RNG for the period 2011-2015**



*Source: Author*

The results obtained as illustrated in figure 4.16 are consistent with some of the findings achieved in the analysis of ASR and LON, but in contradiction with the findings achieved in the analysis of HAR, SNU and MRF.

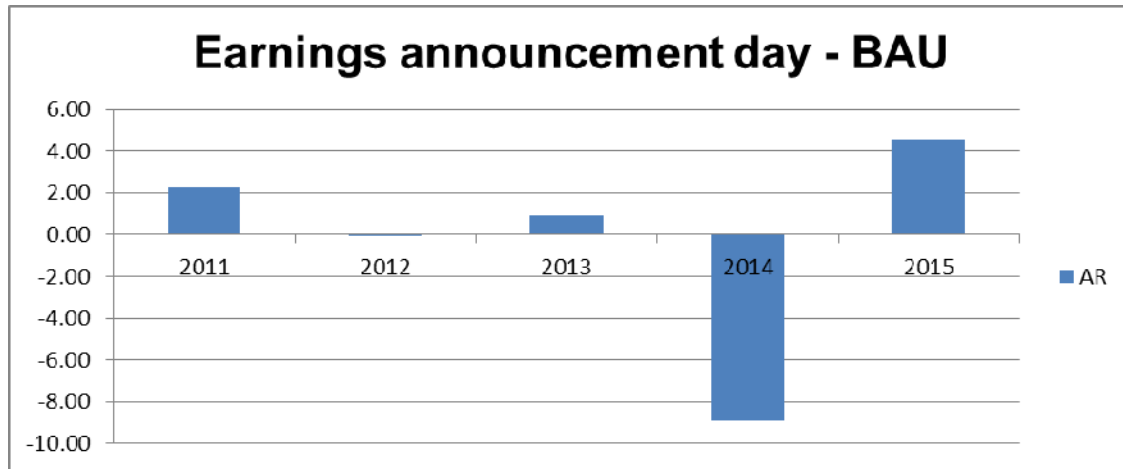
- The years 2011 and 2014 yielded the negative AR for the period 2011- 2015.
- An AR of -2.80% was calculated in 2011 and in 2013 the result of the earnings announcement yielded -0.42%
- The results for the years 2012, 2013 and 2015 were all positive; however 2015 yielded a higher AR.
- The AR returns for these years were 9.27%, 0.22% and 17.84% respectively. The 2015 RNG results coincide with the AR figures yielded by ASR and LON.

A graphical representation of the AR results during a three-day event window surrounding the earnings announcement day is presented in figure 4.72 found in Appendix F.

#### 4.3.17 Bauba Platinum (BAU)

The AR calculation for BAU on the earnings announcement day for the period 2011-2015 is graphically illustrated in figure 4.17. These results relating to AR calculations are discussed below.

**Figure 4.17: Abnormal returns (AR) for BAU for the period 2011-2015**



*Source: Author*

As illustrated in figure 4.17 above, the results pertaining to the AR calculated on the earnings announcement day for BAU were positive overall. Yet, there are still inconsistencies. These inconsistencies include the following:

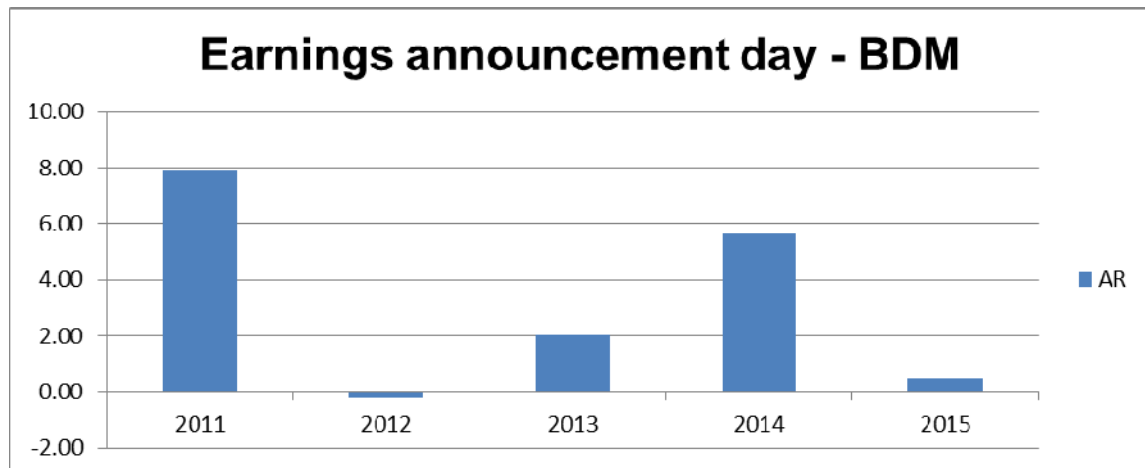
- The highest negative AR of -8.89% was obtained during 2014, whereas 2012 realised the lowest negative AR of -0.05% during the earnings announcements of BAU;
- However, a positive AR was calculated for the years 2011, 2013 and 2015; and
- In 2011, an AR of 2.31% was achieved, followed by an AR of 0.93% for 2013 and lastly 4.55% was achieved in 2015.

These results are consistent with the results of AR obtained for ANG and DRD. However, they contradict the findings for ASR. A graphical representation of the AR results during a three-day event window surrounding the earnings announcement day is presented in figure 4.73 found in Appendix F.

### 4.3.18 Buildmax Ltd (BDM)

The AR calculations obtained during the analysis of BDM on the earnings announcement day for the period 2011-2015 showed mostly favourable results, as graphically presented in figure 4.18 below.

**Figure 4.18: Abnormal returns (AR) for BDM for the period 2011-2015**



*Source: Author*

An overall positive trend in the results of BDM is depicted by the graphical representation above. The analyses of BDM results are as follows:

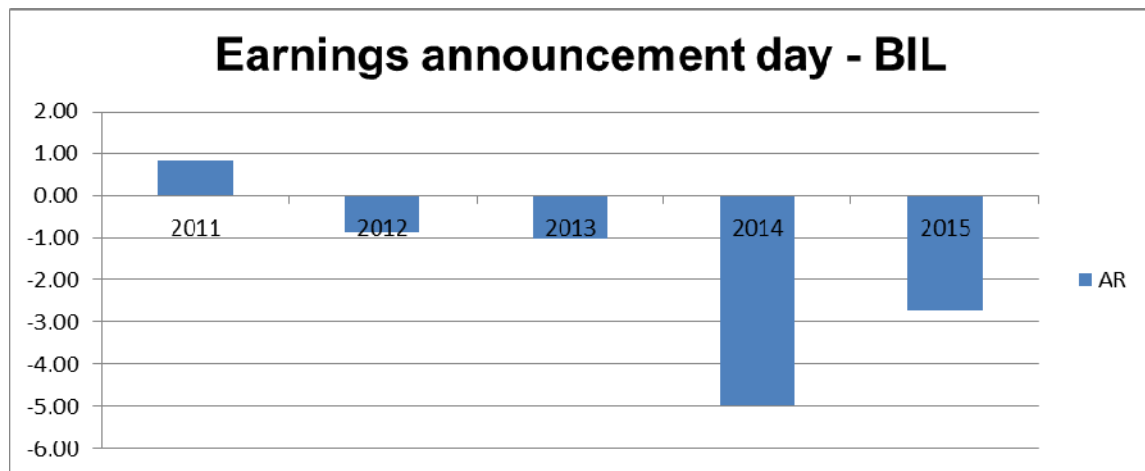
- Four of the five years displayed a positive trend of AR figures; in 2011 the figure was 7.90% and the 2013 result was 2.01%. In 2014 and 2015 the results were 5.64% and 0.45% respectively; and
- The results for 2012 were on the negative side of the trend line, showing a surprisingly negative AR of -0.23%.

The negative movement on the AR for 2012 is consistent with the results for ARI, LON and MRF. A graphical representation of the AR results during a three-day event window surrounding the earnings announcement day is presented in figure 4.74 found in Appendix F.

#### 4.3.19 BHP Billiton Plc (BIL)

The results relating to the AR calculation of BIL on the earnings announcement day for the period 2011-2015 are graphically presented in figure 4.19 and these results are discussed below.

**Figure 4.19: Abnormal returns (AR) for BIL for the period 2011-2015**



*Source: Author*

As illustrated in the graphical depiction above, the overall AR obtained by BIL was negative on the earnings announcement dates. However, the following years yielded interesting results:

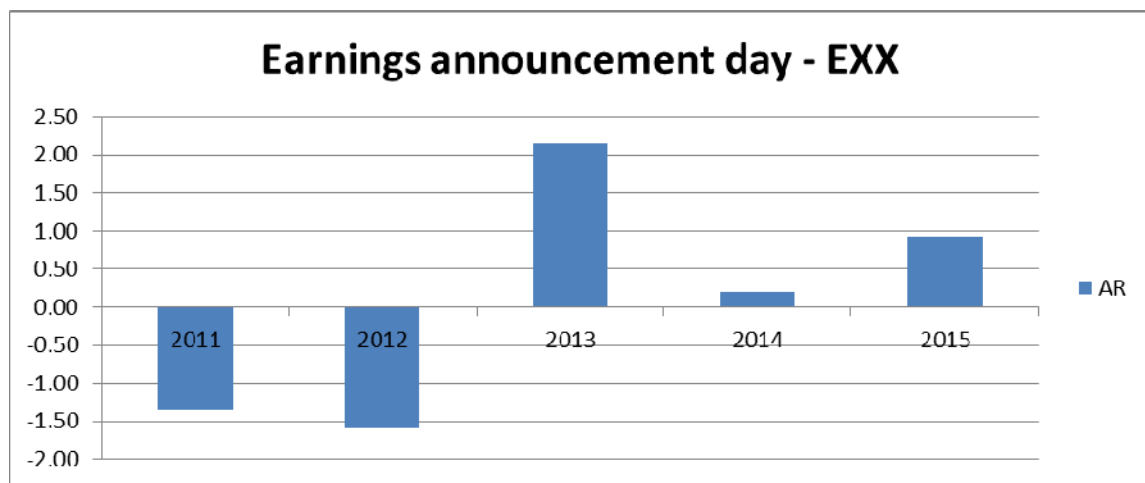
- The AR obtained in the first year of study was positive; the yield in this period was 0.83%.
- There was a negative AR response to earnings announcements of BIL for the years 2012, 2013, 2014 and 2015;
- In the years 2012 and 2013, BIL yielded a moderate AR of -0.86% and -1.46% respectively on the earnings announcement dates; and
- The years 2014 and 2015 respectively realised a high negative AR of -4.97% and -2.72%.

A graphical representation of the AR results during a three-day event window surrounding the earnings announcement day is presented in figure 4.75 found in Appendix F.

#### 4.3.20 Exxaro Resources (EXX)

The AR obtained during the analysis of results of EXX on the earnings announcement day for the period 2011-2015 showed some inconsistencies, as graphically depicted in figure 4.20 below.

**Figure 4.20: Abnormal returns (AR) for EXX for the period 2011-2015**



*Source: Author*

The graph depicted in figure 4.20 above indicated overall positive results. However, there is no consistency in the results. The first two years portrayed a negative trend, whereas the last three years presented a positive trend.

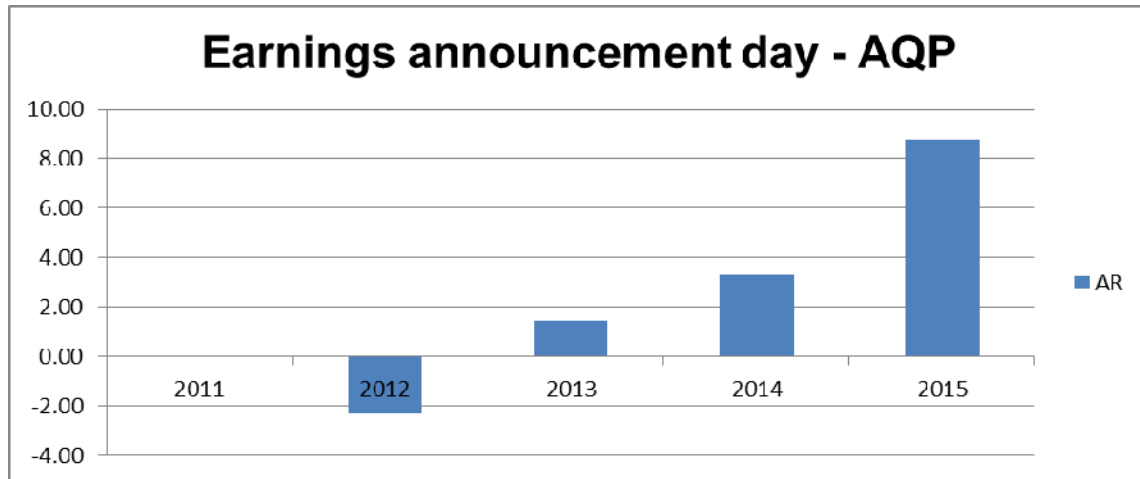
- The years 2011 and 2012 yielded the negative AR for the period;
- An AR of -1.35% was calculated in 2011 and in 2012 the result of the earnings announcement yielded -1.59%;
- The results for the years 2013, 2014 and 2015 were all positive; however 2013 yielded a higher AR; and
- The AR returns for these years were 2.15%, 0.19% and 0.93% respectively.

These results are consistent with the results of AR obtained for ASR and LON. A graphical representation of the AR results during a three-day event window surrounding the earnings announcement day is presented in figure 4.76 found in Appendix F.

### 4.3.21 Aquarius Platinum (AQP)

The calculation of AR for AQP on the earnings announcement day for the period 2011-2015 is graphically demonstrated in figure 4.21. These results relating to AR calculations are discussed as follows:

**Figure 4.21: Abnormal returns (AR) for AQP for the period 2011-2015**



*Source: Author*

An overall positive trend in the results of AQP is depicted by the graphical representation above. The analyses of BDM results are presented below:

- Four of the five years displayed a positive and increasing trend of AR figures; in 2011 the figure was 0.03% and the 2013 result was of 1.47%. In 2014 and 2015, the results were 3.47% and 8.80% respectively; and
- The results for 2012 were negative, showing a surprisingly negative AR of -2.30%.

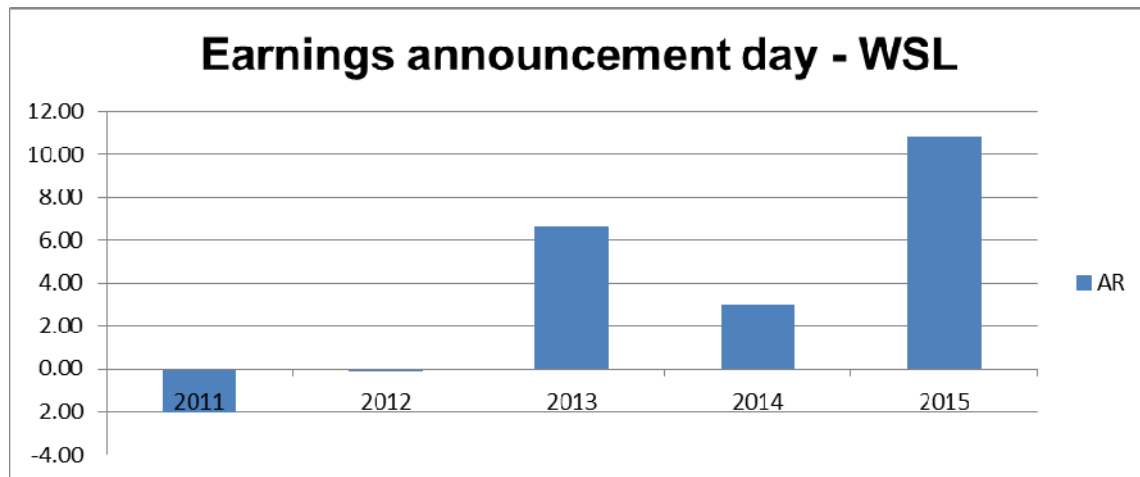
The negative movement on the AR for 2012 is consistent with the results for BDM. A graphical representation of the AR results during a three-day event window surrounding the earnings announcement day is presented in figure 4.77 found in Appendix F.



#### 4.3.22 Wescoal Holdings (WSL)

The results pertaining to the AR calculation of WSL on the earnings announcement day for the period 2011-2015 are graphically presented in figure 4.22 and these results are presented below.

**Figure 4.22: Abnormal returns (AR) for WSL for the period 2011-2015**



*Source: Author*

The graphical presentation in figure 4.22 above indicates overall positive results. However, there are some inconsistencies in the results. The first two years portrayed a negative trend, whereas the last three years presented a positive trend.

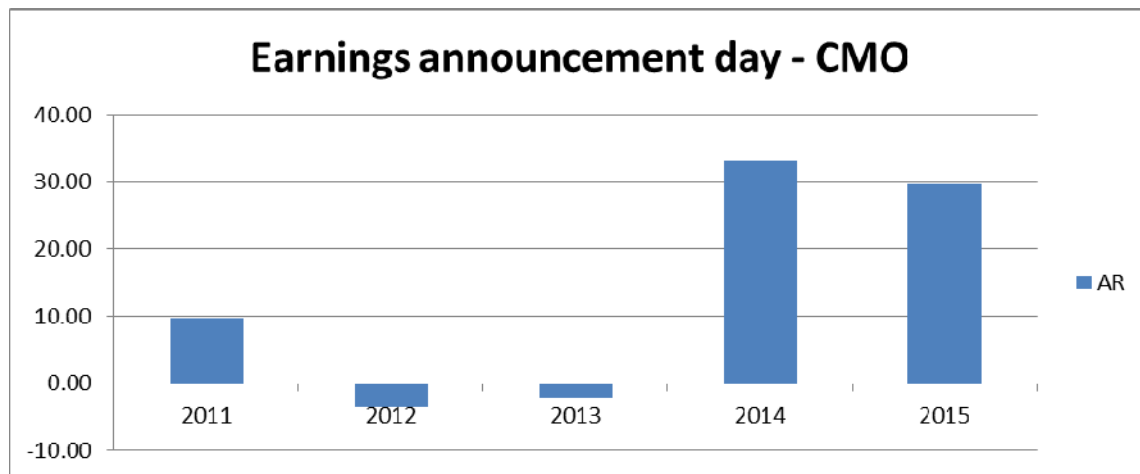
- The years 2011 and 2012 yielded the negative AR for the period;
- The 2012 figure was the lowest for the full period under study;
- An AR of -2.00% was calculated in 2011 and in 2012 the result of the earnings announcement yielded -0.12%;
- The results for the years 2013, 2014 and 2015 were all positive; however 2015 yielded a higher AR; and
- The AR returns for these years were 6.63%, 2.98% and 10.83% respectively.

These results are consistent with the results of AR obtained for ASR and LON. A graphical representation of the AR results during a three-day event window surrounding the earnings announcement day is presented in figure 4.78 found in Appendix F.

#### 4.3.23 Chrometco Ltd (CMO)

The AR obtained during the analysis of results of CMO on the earnings announcement day for the period 2011-2015 showed some inconsistencies, as graphically depicted in figure 4.23 below.

**Figure 4.23: Abnormal returns (AR) for CMO for the period 2011-2015**



*Source: Author*

As illustrated in figure 4.23 above, the overall results pertaining to the AR calculated on the earnings announcement day for CMO were overall positive, yet they are still inconsistent. These inconsistencies include the following:

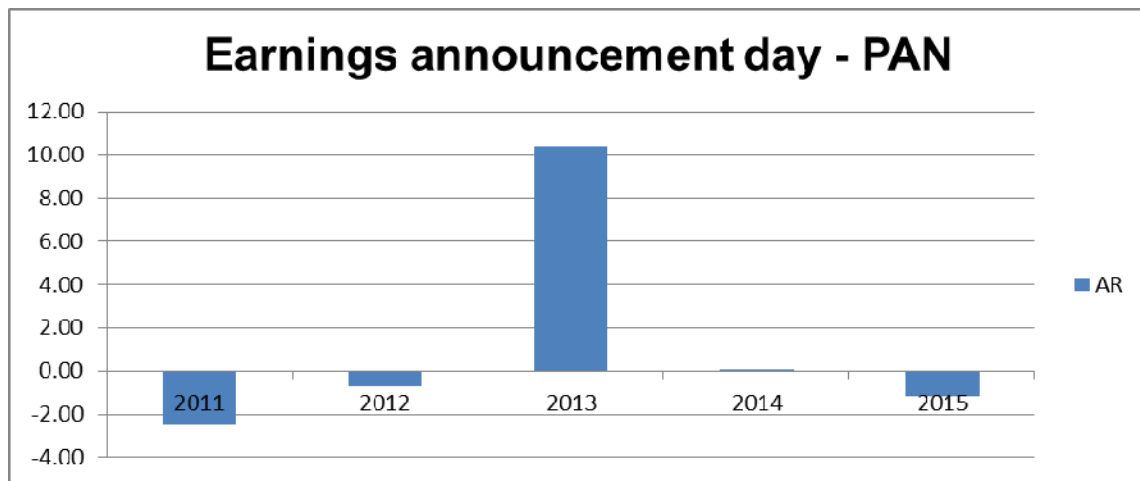
- The highest negative AR of 33.02% was obtained during 2014, whereas 2013 realised the lowest negative AR of -2.14% during the earnings announcements of CMO results;
- The AR calculated for the years 2011, 2012 and 2015 were as follows:
- In 2011 an AR of 9.72% was achieved, followed by an AR of -3.58% for 2012 and finally 29.71% was achieved in 2015.

These results are consistent with the results of AR obtained for ANG and DRD. However, they contradict the findings for ASR. A graphical representation of the AR results during a three-day event window surrounding the earnings announcement day is presented in figure 4.79 found in Appendix F.

#### 4.3.24 Pan African Resources (PAN)

The results pertaining to the AR calculation of PAN on the earnings announcement day for the period 2011-2015 are graphically presented in figure 4.24 and these results are discussed below.

**Figure 4.24: Abnormal returns (AR) for PAN for the period 2011-2015**



*Source: Author*

An overall negative AR was achieved in the analysis of PAN for the period 2011-2015. However, there is some inconsistencies present within these results. The most important of these inconsistencies include:

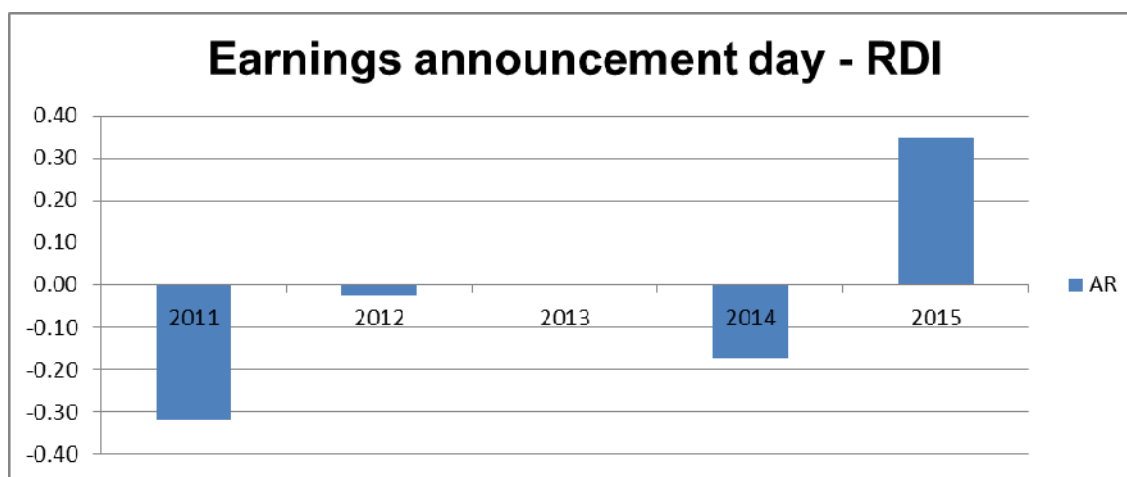
- The lowest AR of 0.05% was recorded in 2014 by PAN.
- The highest AR of 10.41% was obtained in 2013; this is consistent with the AR results of ANG and MRF during the same period;
- However 2011, 2012 and 2015 realised a negative AR of -2.49%, -0.73% and -1.16% respectively.

A graphical representation of the AR results during a three-day event window surrounding the earnings announcement day is presented in figure 4.80 found in Appendix F.

#### 4.3.25 Rockwell Diamonds Incorporated (RDI)

The results relating to the AR calculation of RDI on the earnings announcement day for the period 2011-2015 are graphically presented in figure 4.25 and these results are discussed as follows:

**Figure 4.25: Abnormal returns (AR) for RDI for the period 2011-2015**



*Source: Author*

The AR calculations in the above graph show an overall negative reaction of the share price movement on the earnings announcement dates. However, the negative trend was somehow insignificant in some of the years.

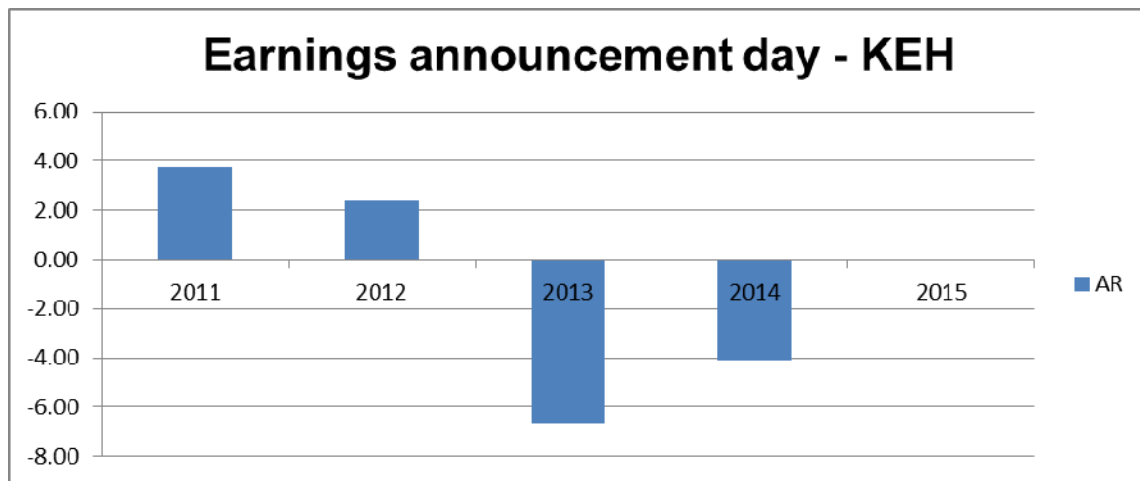
- The years 2012 and 2013 yielded the lowest negative AR results of 0.02%, 0.00% respectively;
- The abnormal returns on the earnings announcement day during 2011 and 2014 reflected -0.32% and -0.17% respectively;
- However, the period covered in this study only show a positive AR during the earnings announcement day in 2015; and
- The AR in 2015 was 0.35%.

The graph above revealed that AMS earnings announcement dates yields more negative AR results for the company. A graphical representation of the AR results during a three-day event window surrounding the earnings announcement day is presented in figure 4.81 found in Appendix F.

#### 4.3.26 Keaton Energy Holdings (KEH)

The AR calculated for KEH on the earnings announcement day for the period 2011-2015 is graphically illustrated in figure 4.26. These results pertaining to AR calculations are discussed below.

**Figure 4.26: Abnormal returns (AR) for KEH for the period 2011-2015**



*Source: Author*

The illustration in figure 4.26 above is the overall results pertaining to the AR calculated on the earnings announcement day for KEH. The calculations show an overall negative trend in the analysis, yet there are still some inconsistencies in the results.

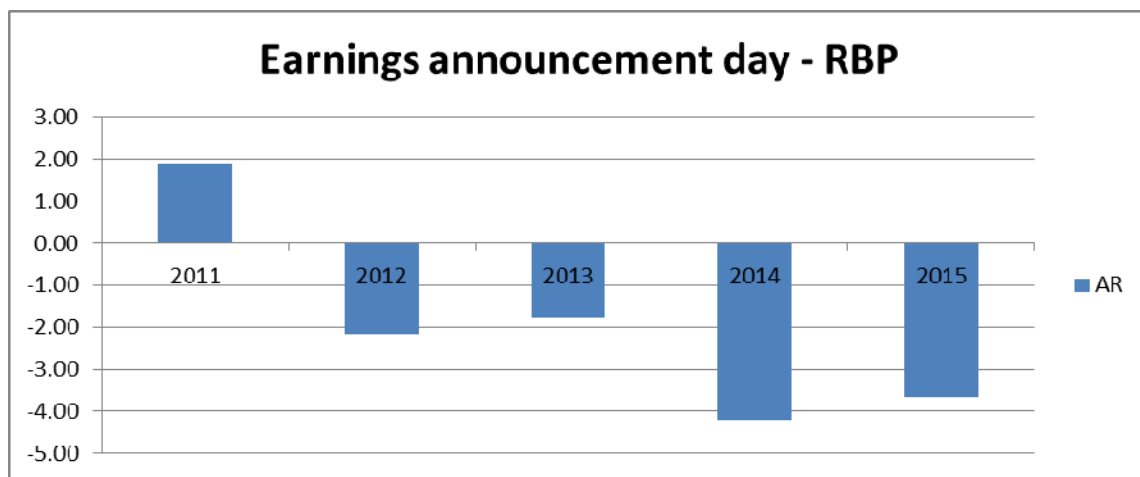
- The highest negative AR of -6.66% was obtained during 2013, whereas 2014 and 2015 revealed a moderate and lowest negative AR respectively;
- The AR for 2014 was -4.08% and the AR for 2015 was 0.08%;
- Similarly, the positive AR was presented for the years 2011 and 2012; and
- In 2011 an AR of 3.75% was achieved, followed by an AR of 0.68% for 2012.

These results are consistent with the results of AR obtained for ANG and DRD. However, they contradict the findings for ASR. A graphical representation of the AR results during a three day event window surrounding the earnings announcement day is presented in figure 4.82 found in Appendix F.

#### 4.3.27 Royal Bafokeng Platinum (RBP)

The graphical presentation of RBP results obtained from the AR calculation on the earnings announcement day for the period 2011-2015 are presented in figure 4.27 below.

**Figure 4.27: Abnormal returns (AR) for RBP for the period 2011-2015**



*Source: Author*

An overall negative trend in the results for RBP is illustrated by the graphical representation above. The negative AR results were recorded from 2012 to 2015.

- The AR obtained in 2011 was 1.86%, and this is the only year where RBP realised a positive market reaction on the earnings announcement day;
- The AR for 2012, 2013, 2014 and 2015 all represented a negative market reaction on the earnings announcement dates; and
- The AR for these years was -2.17%, -1.76%, -4.19% and -3.65% respectively.

These results are consistent with the results of AR calculations obtained for ARI. However, they contradict the findings for AMS and AGL. A graphical representation of the AR results during a three-day event window surrounding the earnings announcement day is presented in figure 4.83 found in Appendix F.

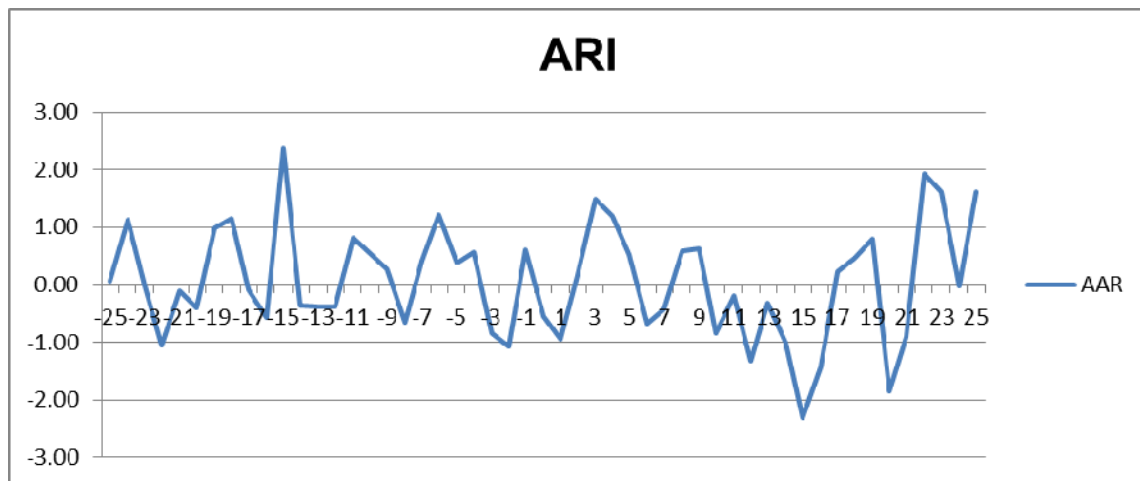
## 4.4 Analysis of average abnormal returns (AAR)

The second process to be followed after determining the abnormal returns (AR) is to calculate the average abnormal returns (AAR) during the course of the event window. This process has been discussed in detail in the previous chapter.

The results relating to the calculation of the AAR are presented graphically in figure 4.28 to figure 4.54 below. These results are illustrated in terms of the AAR over the 51 day event window period for each of the respective companies represented in the sample.

The importance of these graphical representations relates to the movements of AAR surrounding the earnings announcement day. The companies will be sequentially analysed as per the list of the final sample. The first results presented relate to African Rainbow Minerals Ltd (ARI) in figure 4.28 and will be discussed below.

**Figure 4.28: AAR for a 51-day event window for ARI for the period 2011-2015**

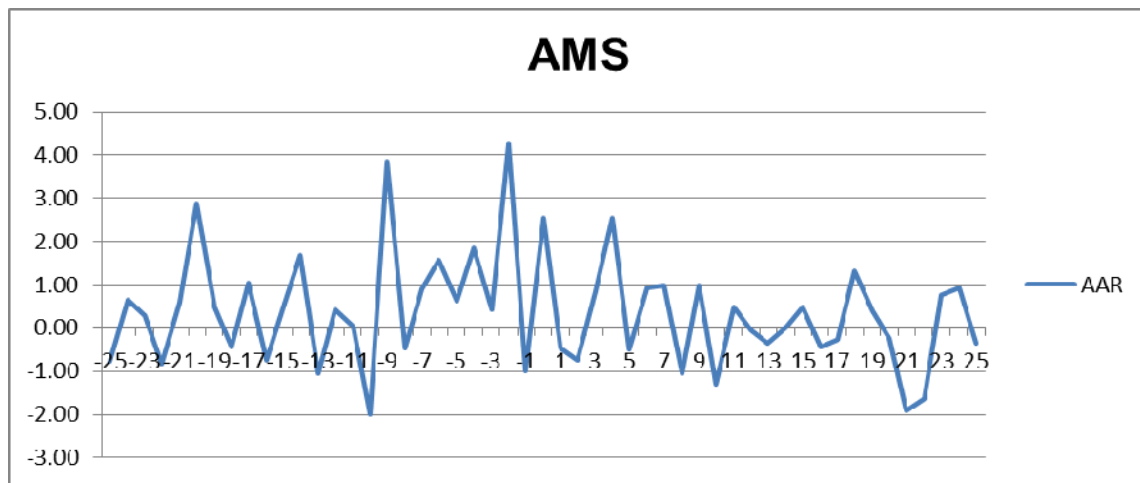


Source: Author

The results presented in figure 4.28 above indicate that 25 days before and 25 days after the announcement of earnings the AAR is inconsistent. They do not seem to be moving in any particular direction. However, on the day of the announcement the AAR show a negative trend, followed by a small positive increase three days after the announcement day.

In figure 4.29 below, which illustrates the AAR calculated for AMS, the results show a positive but not a steady increase seven days prior to the earnings announcement day.

**Figure 4.29: AAR for a 51-day event window for AMS for the period 2011-2015**

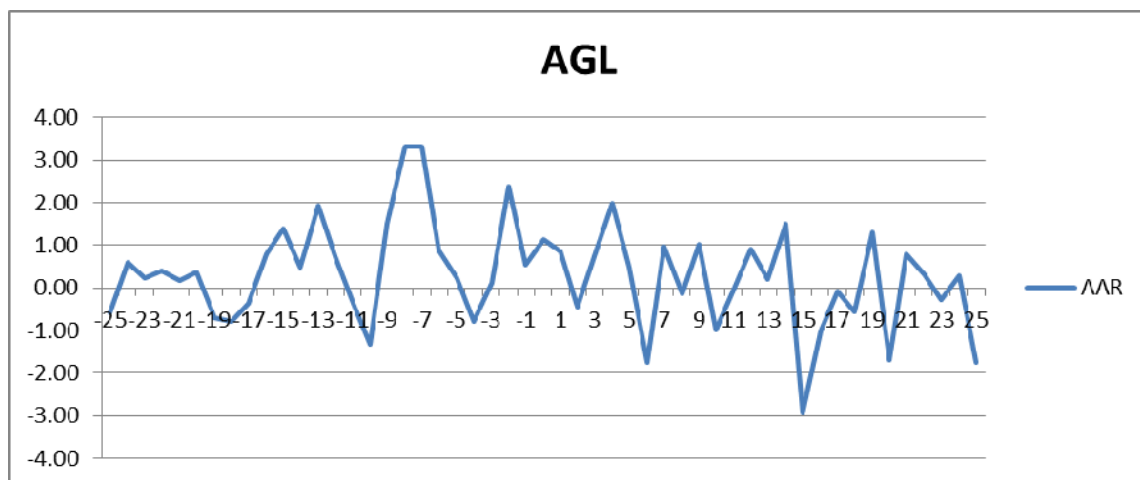


Source: Author

Furthermore, as indicated by the results of ARI above (figure 4.28) the results became negative on the earnings announcement day. After the earnings announcement day, AMS results declined more often to the negative trend.

Following from the above results of AMS, figure 4.30 illustrates the AAR results calculated for AGL.

**Figure 4.30: AAR for a 51-day event window for AGL for the period 2011-2015**



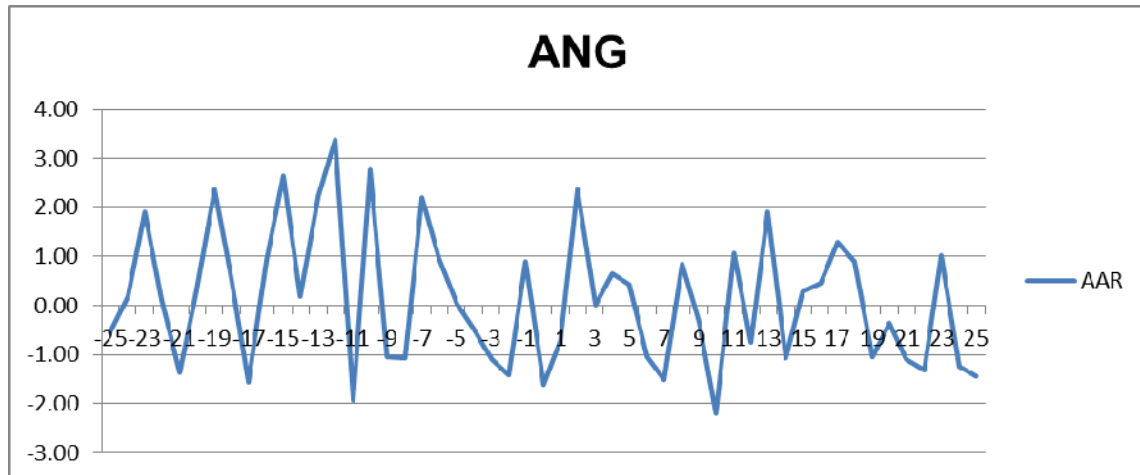
Source: Author



Nine days prior to the announcement of AGL final year results, the AAR kept a positive trend through to the announcement date. However, two days after the announcement, the results became inconsistent. This may be due to the nature of the earnings announcement.

Figure 4.31 below presents the results obtained regarding the AAR calculation for ANG.

**Figure 4.31: AAR for a 51-day event window for ANG for the period 2011-2015**

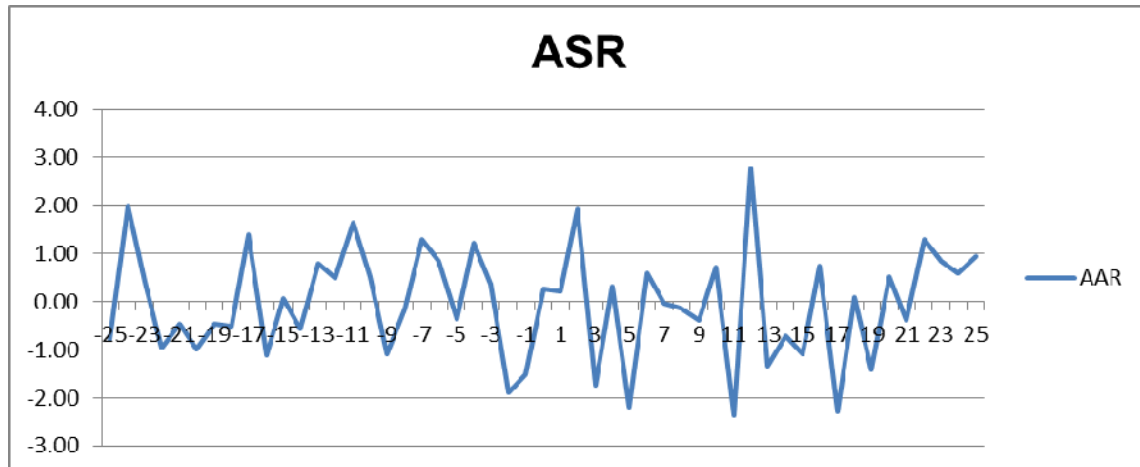


*Source: Author*

The results in figure 4.31 indicate a huge positive increase in the days prior to the earnings announcement day. However, immediately after the earnings announcement, the results showed a more negative trend.

Figure 4.32 below, which illustrates the AAR movements for ASR, gives a complete picture of the 51-day event window.

**Figure 4.32: AAR for a 51-day event window for ASR for the period 2011-2015**

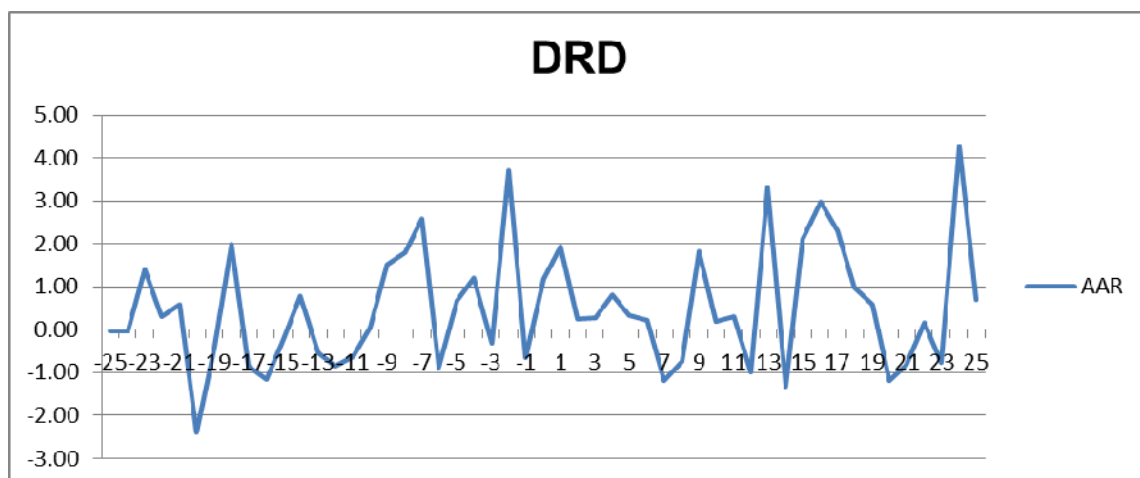


*Source: Author*

The results presented in figure 4.32 indicate a negative trend two days before the earnings announcement day. However, two days after the announcement there was a slight shift to the positive trend.

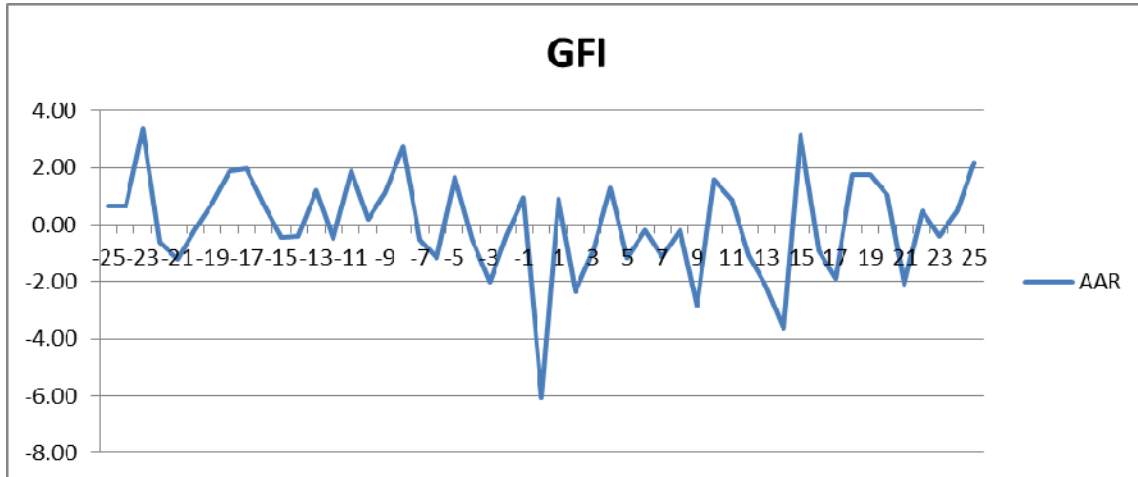
In contrast with the results found for ASR above, figure 4.33 indicates mixed results of the AAR prior to the earnings announcement of DRD results. The positive trend is achieved during the announcement date through to the sixth day after the earnings announcement day.

**Figure 4.33: AAR for a 51-day event window for DRD for the period 2011-2015**



*Source: Author*

**Figure 4.34: AAR for a 51-day event window for GFI for the period 2011-2015**

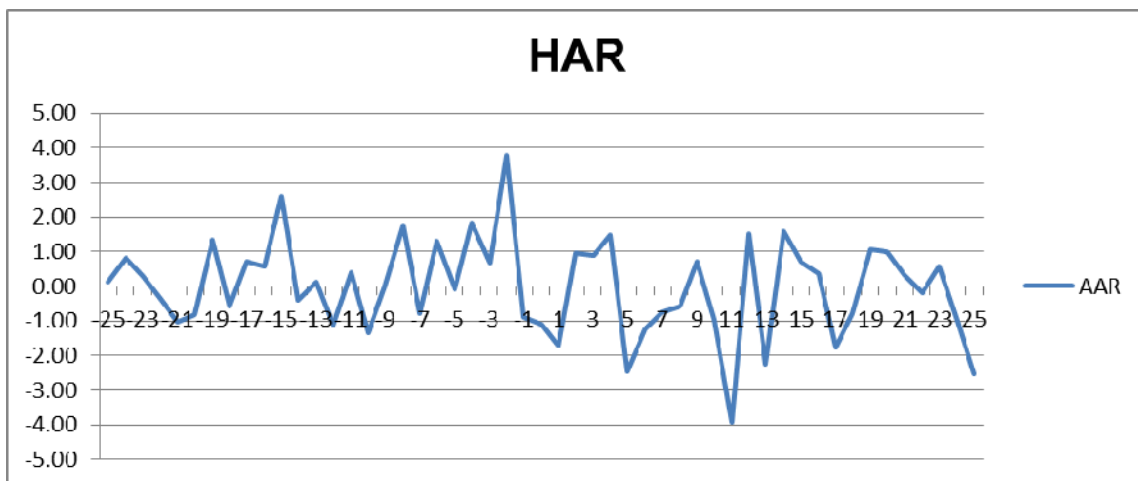


*Source: Author*

The results for GFI in figure 4.34 above portray an interesting picture. On the earnings announcement day, the AAR presents a huge negative trend. This shows that the market reacts negatively to the earnings announcement results for GFI.

A slight negative trend in AAR was recorded in figure 4.35 for HAR one day before the earnings announcement, also on the day of the announcement and one day after the announcement date. However, the trend was positive three days before and after the period mentioned in the first sentence of this paragraph.

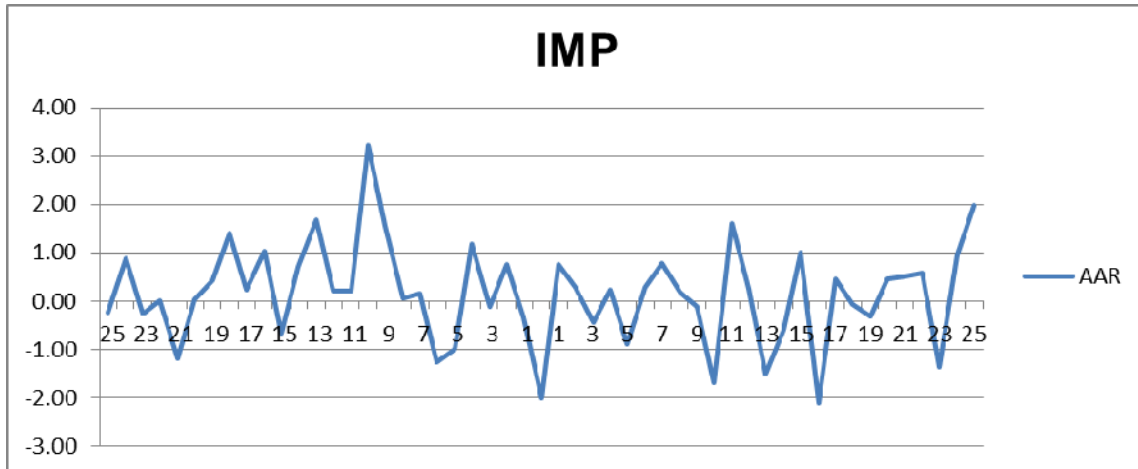
**Figure 4.35: AAR for a 51-day event window for HAR for the period 2011-2015**



*Source: Author*

Not coinciding with the above results obtained for HAR, the AAR illustrated in figure 4.36 below for IMP indicates an overall positive trend in AAR on the earnings announcement day.

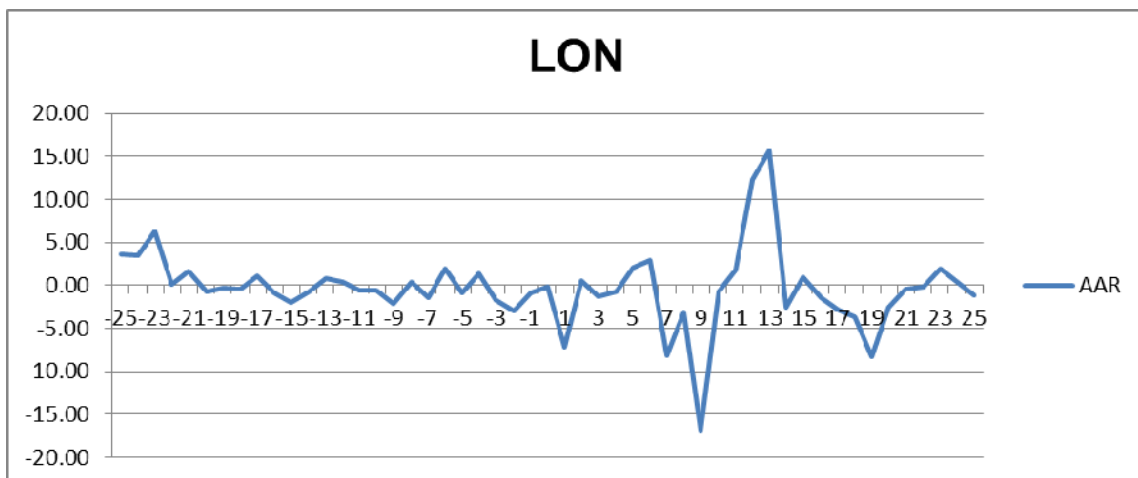
**Figure 4.36: AAR for a 51-day event window for IMP for the period 2011-2015**



Source: Author

The results for IMP regarding the AAR calculation as presented in figure 4.36 indicates a significant positive trend before the earnings announcement day, followed by a significant negative trend after the announcement date.

**Figure 4.37: AAR for a 51-day event window for LON for the period 2011-2015**

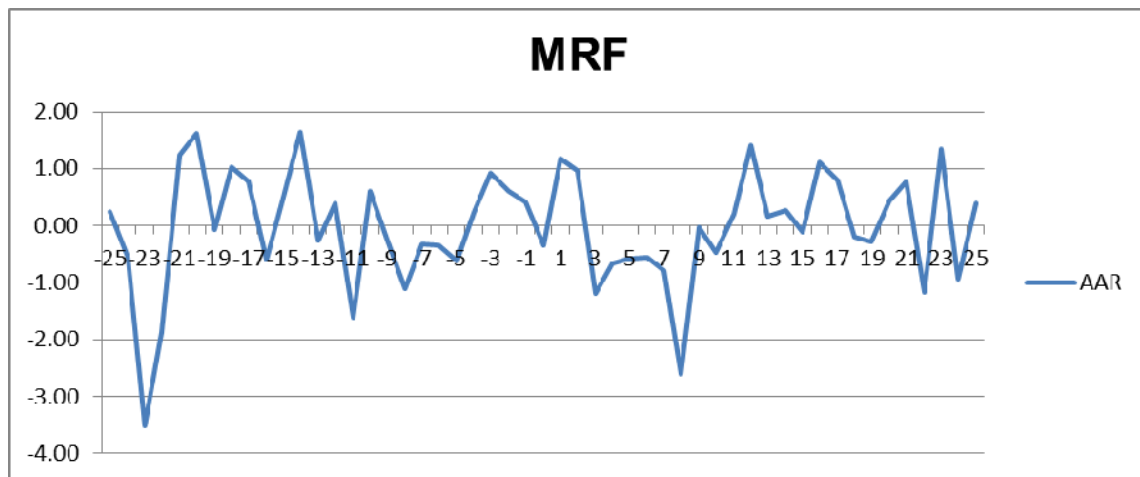


Source: Author

The results presented in figure 4.37 above disclose an interesting picture for LON. The AAR calculations before the earnings announcement day show a very low constant negative trend until the announcement day. After the earnings announcement day, the trend showed a huge negative trend until the 10th day, but immediately followed by a huge positive trend.

The results for the AAR calculations for MRF are presented in figure 4.38 below.

**Figure 4.38: AAR for a 51-day event window for MRF for the period 2011-2015**

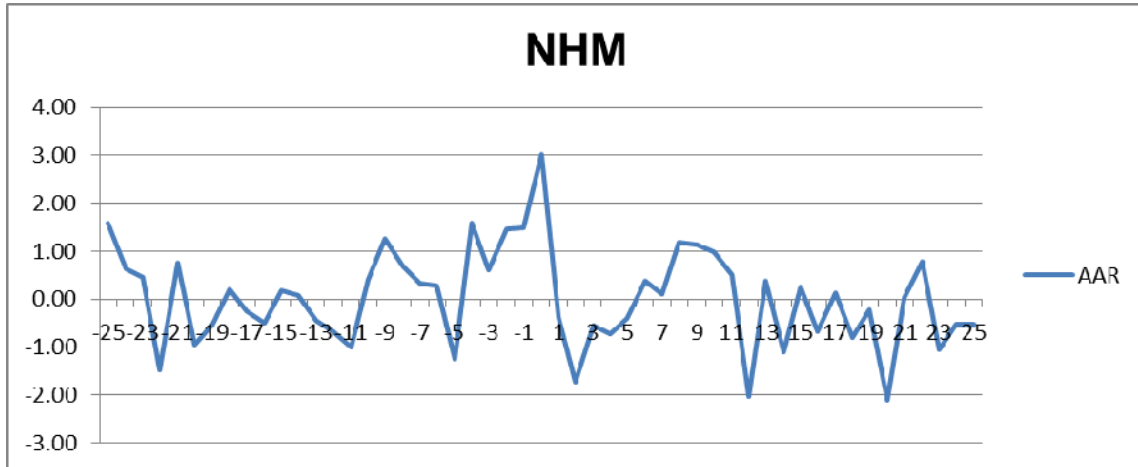


*Source: Author*

The AAR recorded in figure 4.38 for MRF indicates that there was a negative AAR on the earnings announcement date. Surprisingly, the two days prior and two days after the announcement day, the AAR was in a positive trend.

In contradiction with the above results found for MRF, figure 4.39 below indicates a positive AAR trend three days prior to the announcement date. On the earnings announcement day, NHM realised a huge positive AAR results, and was immediately followed by a negative trend.

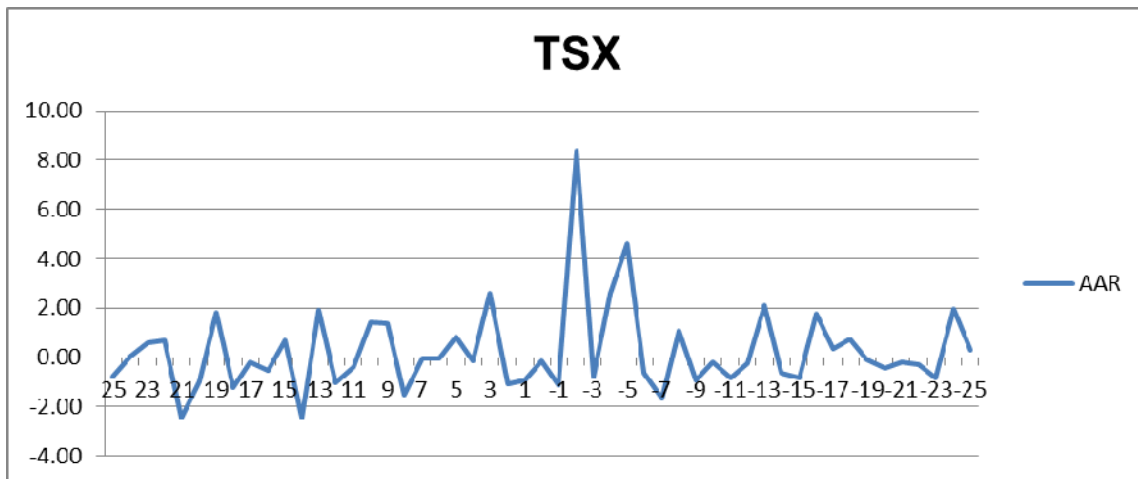
**Figure 4.39: AAR for a 51-day event window for NHM for the period 2011-2015**



Source: Author

The results for TSX about the AAR calculation as presented in figure 4.40 below indicate an overall negative trend.

**Figure 4.40: AAR for a 51-day event window for TSX for the period 2011-2015**

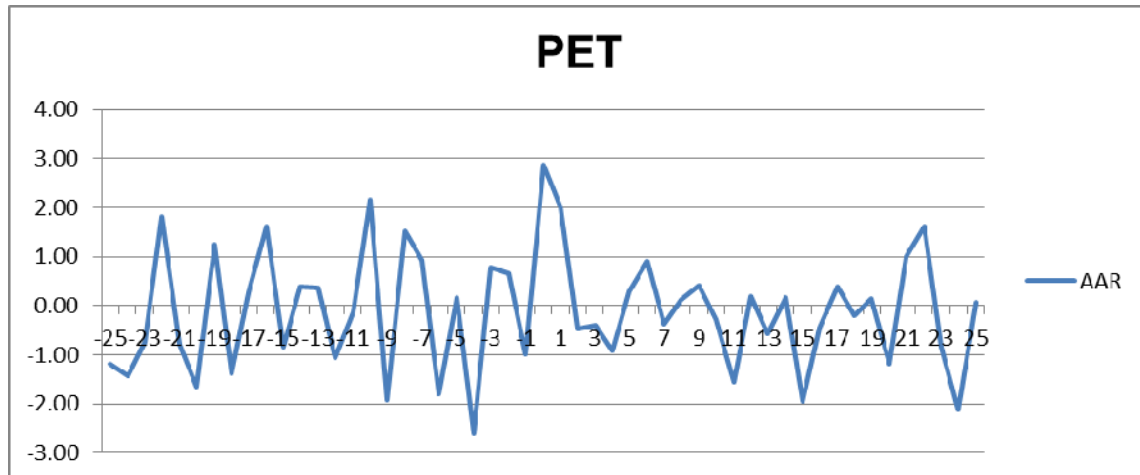


Source: Author

Furthermore, TSX experienced a negative AAR trend around the earnings announcement date, that is, a day before the announcement, during the announcement and a day after the announcement of its results.

The graphical illustration of results obtained from the AAR calculation of PET on the period surrounding the earnings announcement day are presented in figure 4.41 below.

**Figure 4.41: AAR for a 51-day event window for PET for the period 2011-2015**

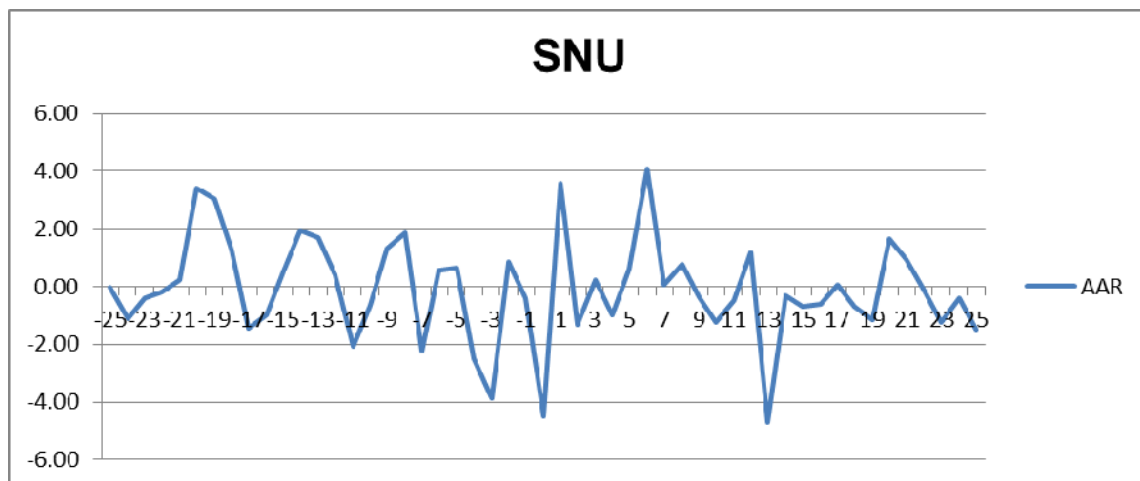


*Source: Author*

The results presented in figure 4.41 for PET AAR calculation disclose an overall inconsistent trend. However, on the day of the announcement the AAR reacted positively on the news.

Not coinciding with the results obtained for PET above, the AAR recorded in figure 4.42 below for SNU indicates a negative AAR on the earnings announcement day.

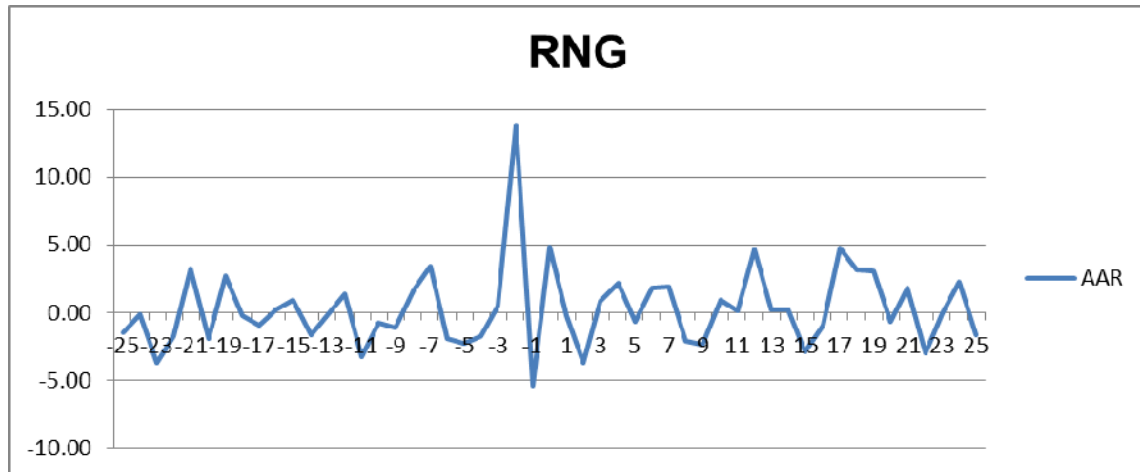
**Figure 4.42: AAR for a 51-day event window for SNU for the period 2011-2015**



*Source: Author*

The AAR recorded in figure 4.43 for RNG below coincides with the results for PET above. The AAR calculation on the earnings announcement day was a large positive figure. However, the days surrounding the earnings announcement day indicated negative results (a day before and after the announcement date.)

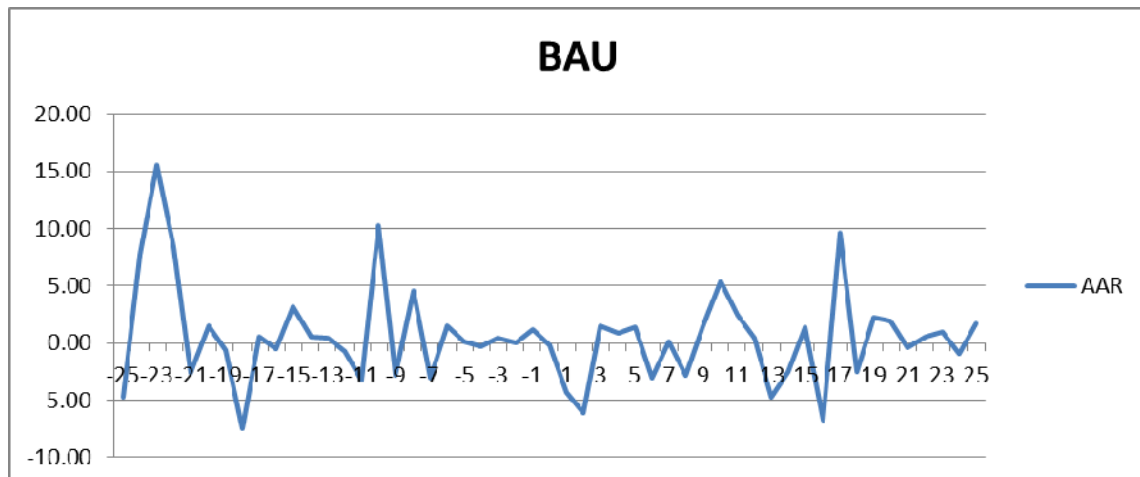
**Figure 4.43: AAR for a 51-day event window for RNG for the period 2011-2015**



Source: Author

Figure 4.44 below illustrates the AAR on the earnings announcement dates for BAU for the period 2011-2015.

**Figure 4.44: AAR for a 51-day event window for BAU for the period 2011-2015**



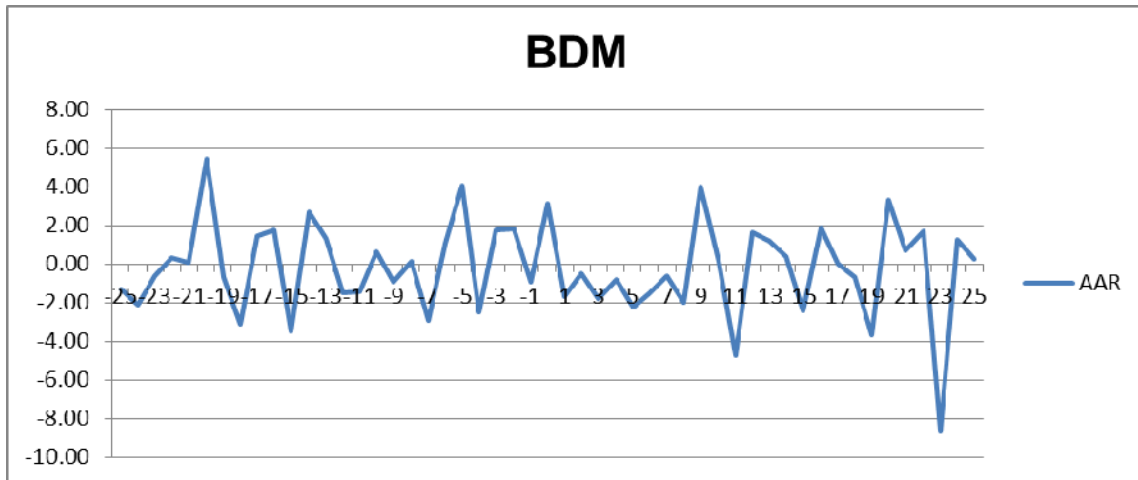
Source: Author



The results for BAU about the AAR calculation as presented in figure 4.44 above indicate an overall positive trend. Three days prior to earnings announcement date the AAR showed a positive trend, which indicated that the market anticipated positive news.

Figure 4.45 below illustrates the AAR movements for BDM surrounding the earnings announcement day.

**Figure 4.45: AAR for a 51-day event window for BDM for the period 2011-2015**

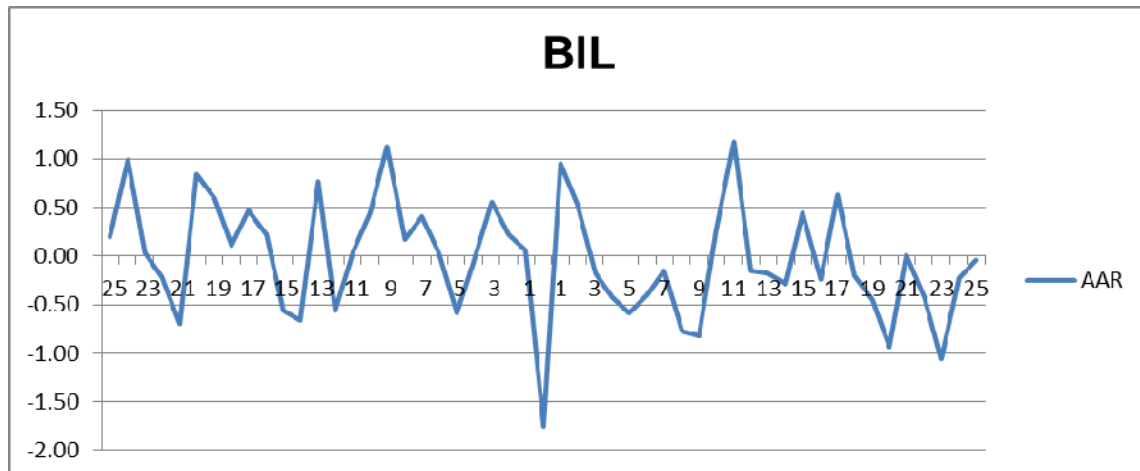


Source: Author

The results presented in figure 4.45 indicate a negative figure a day prior to, and a day after the earnings announcement. During the day of the announcement, BDM showed a positive trend in AAR. These results are consistent with the results obtained for AMS.

In contradiction with the results found for BDM and RNG, figure 4.46 indicates a positive trend two days before and two days after the earnings announcement for BIL. However, the AAR for BIL, presented in figure 4.46 below, indicates a negative figure during the earnings announcement day.

**Figure 4.46: AAR for a 51-day event window for BIL for the period 2011-2015**

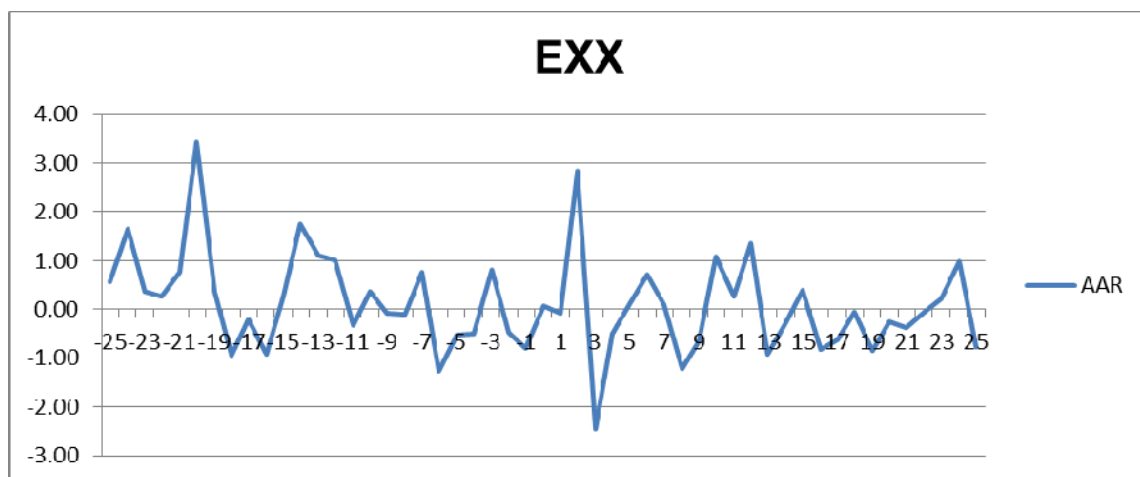


*Source: Author*

The results presented in figure 4.46 indicate slight positive increase on the ninth day before the announcement. There were also a negative trend a day before and a day after the earnings announcement.

Concurring with the results obtained for BDM and RNG, the AAR recorded in figure 4.47 below for EXX indicate a positive AAR on the earnings announcement day.

**Figure 4.47: AAR for a 51 day event window for EXX for the period 2011-2015**

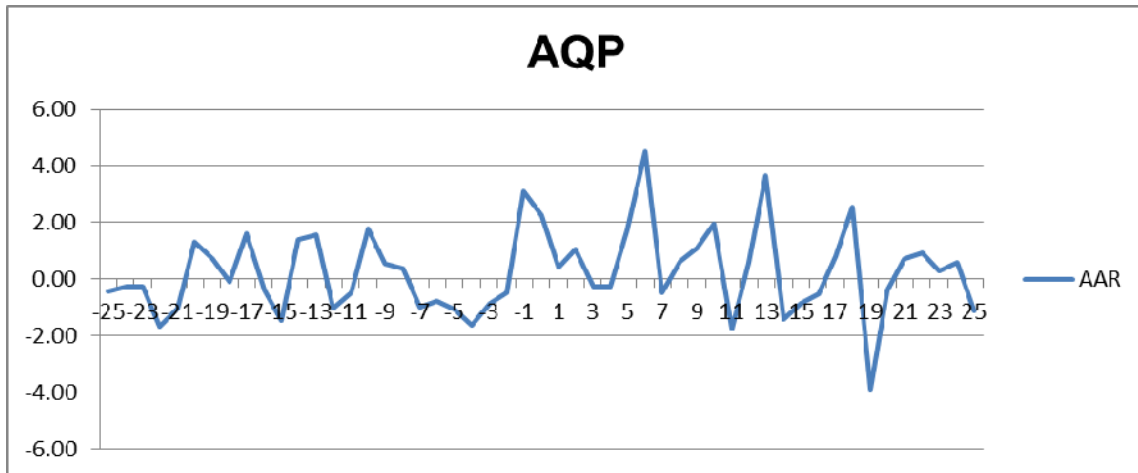


*Source: Author*

The results presented in figure 4.47 above indicate a negative figure a day prior to, and a day after the earnings announcement. During the day of the announcement, EXX revealed a positive trend in AAR.

Similar to the AAR results obtained for AGL, the results presented in figure 4.48 for the AAR calculated for AQP are discussed below.

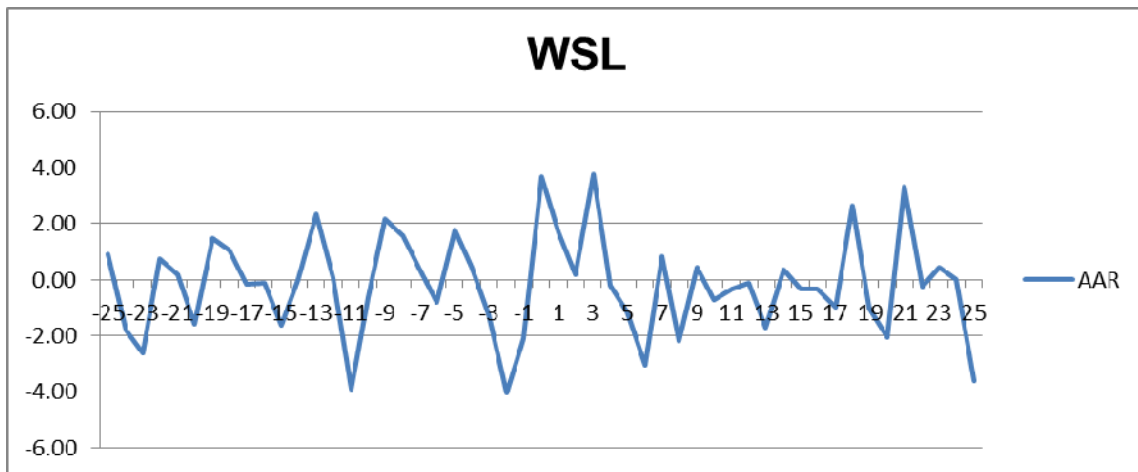
**Figure 4.48: AAR for a 50-day event window for AQP for the period 2011-2015**



Source: Author

The AAR presented in figure 4.48 illustrates a positive trend for WSL on the earnings announcement day, with a slightly positive movement one day before the announcement date and two days after the earnings announcement date.

**Figure 4.49: AAR for a 51-day event window for WSL for the period 2011-2015**

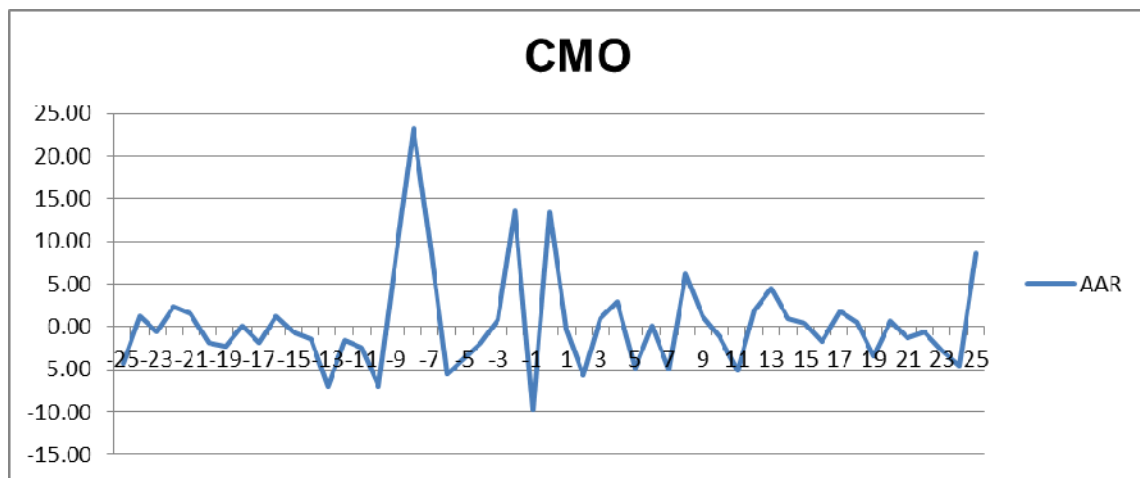


Source: Author

Figure 4.49 above illustrates that for WSL an increase in AAR, it is acquired on the earnings announcement day followed by a positive trend in AAR for the three days following the earnings announcement. The three days preceding the earnings announcement event indicate a negative trend, which suggests the market were anticipating bad news on the announcement day.

The results presented in figure 4.50 below pertaining to the AAR calculation of CMO show an overall negative trend. However, these results are consistent with the AAR results of AMS and RNG.

**Figure 4.50: AAR for a 51-day event window for CMO for the period 2011-2015**

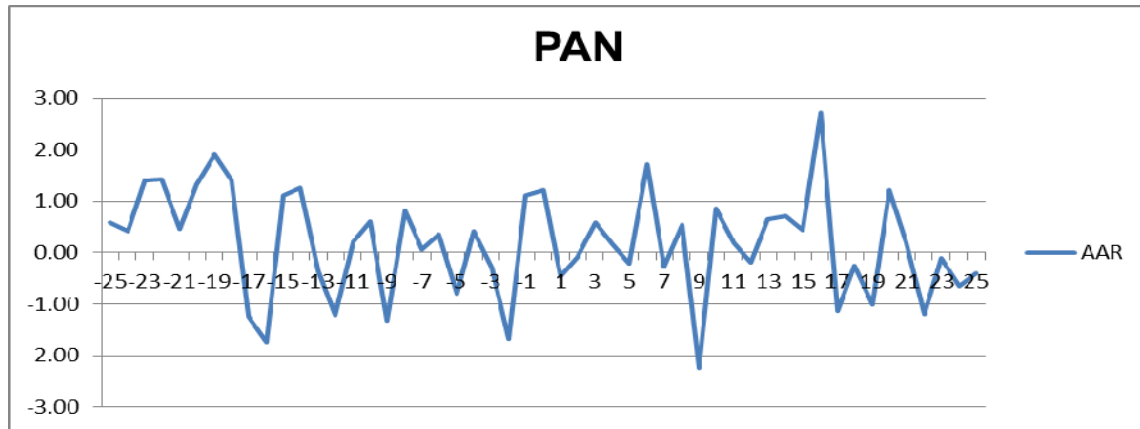


*Source: Author*

The graphical representation in figure 4.50 indicates that there is a large positive movement of the AAR results for CMO on the earnings announcement date. Surprisingly, whenever there is a positive movement in some days, it becomes so huge, such as in the eighth day preceding the announcement.

Figure 4.51 below presents the results achieved regarding the AAR calculation for PAN.

**Figure 4.51: AAR for a 51-day event window for PAN for the period 2011-2015**

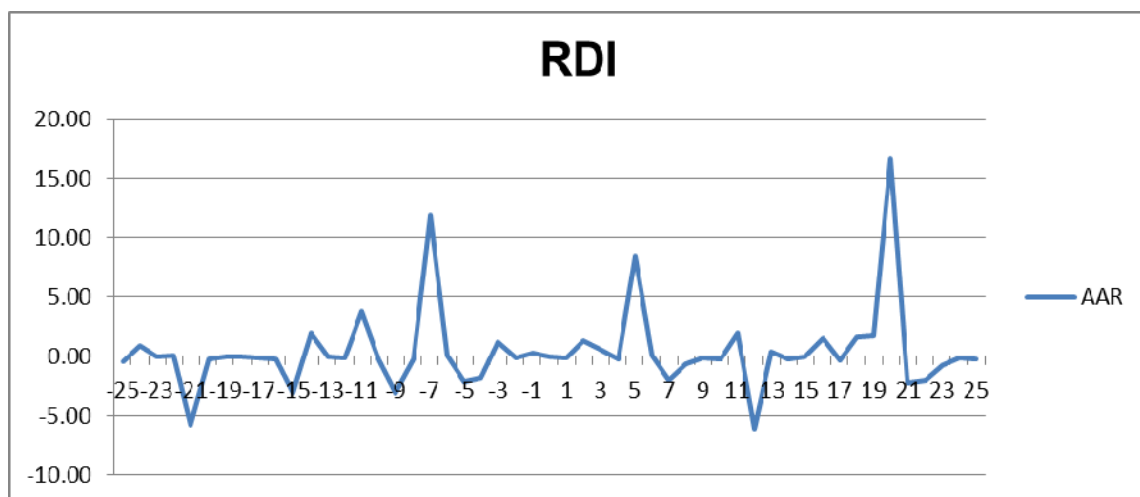


*Source: Author*

The results presented in figure 4.51 indicate an overall positive trend on the AAR calculation for PAN. The AAR on the earnings announcement day shows a positive trend. However, it immediately shifted to the negative in the two days following the announcement.

Figure 4.52 below, which graphically presents the AAR calculation results for RDI, indicates an overall negative trend. Coinciding with the results obtained for the AAR calculations for CMO as discussed previously.

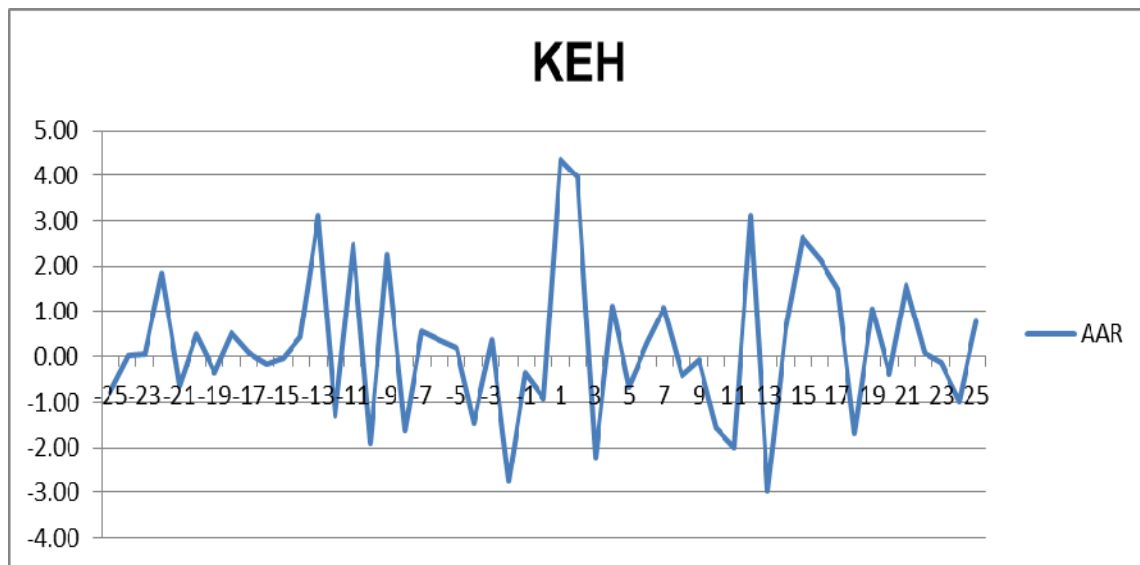
**Figure 4.52: AAR for a 51-day event window for RDI for the period 2011-2015**



*Source: Author*

The graph on figure 4.52 indicates that there is a large positive movement of the AAR results for RDI on the seventh day preceding the announcement date and the twentieth day after the earnings announcement date.

**Figure 4.53: AAR for a 51-day event window for KEH for the period 2011-2015**

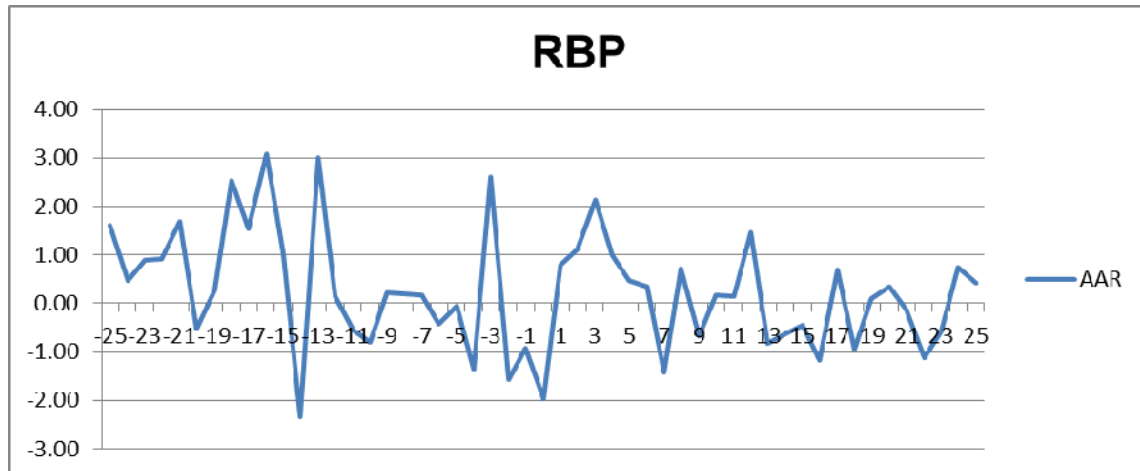


*Source: Author*

Figure 4.53 above demonstrates that for KEH a positive AAR is acquired on the day after the earnings announcement date. There is a negative AAR figure calculated on the earnings announcement day. This was preceded with a negative AAR two days before the earnings announcement event.

Similar to the AAR results obtained for KEH above, the results presented in figure 4.54 below, the AAR calculated for RBP, are discussed as follows;

**Figure 4.54: AAR for a 51-day event window for RBP for the period 2011-2015**



*Source: Author*

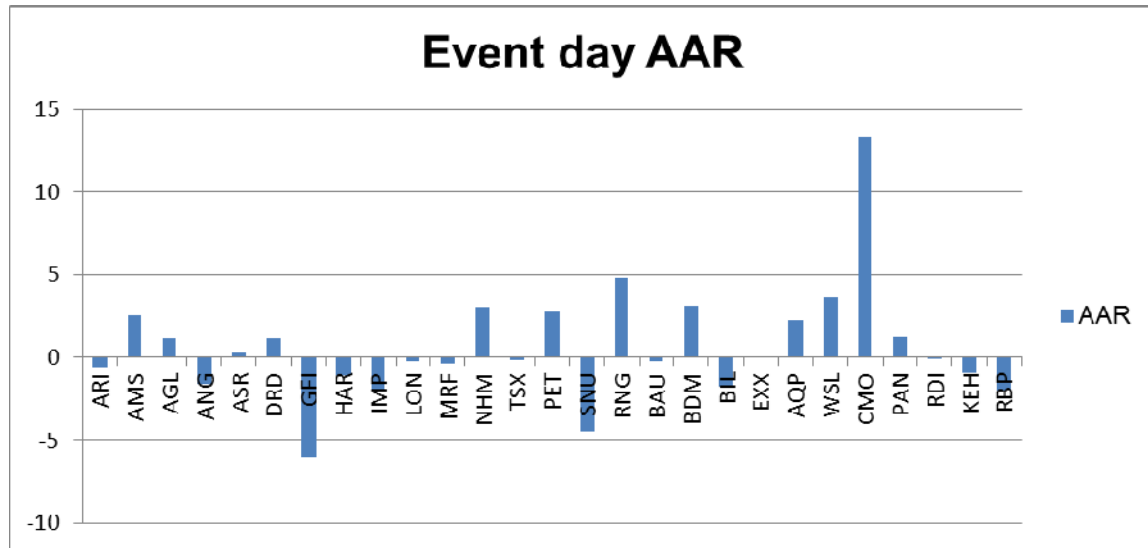
There is a negative AAR figure calculated on the earnings announcement day of RBP, which was preceded by a negative AAR two days before the earnings announcement event. These results reveal that for RBP a positive AAR is acquired on the next six days following the earnings announcement date.

The next section presents and briefly discusses the descriptive results pertaining to the calculation of the AAR.

#### **4.4.1 Results of average abnormal returns (AAR)**

The results relating to the calculation of the AAR for the sample companies are graphically illustrated in figure 4.55 below and the summary of the AAR results are presented in table 4.1 and table 4.2 found in appendix G.

**Figure 4.55: Event day AAR for the sample companies for the period 2011-2015**



*Source: Author*

The above graphical presentation indicates mixed results achieved on the calculation of AAR for the sample companies. However, the following intriguing results were obtained:

- GFI had the lowest AAR of -6.05% and CMO obtained the highest AAR of 13.35 %; and
- The mean AAR across the 27 sample companies was 0.67%.

The results relating to the AAR seem to indicate a positive market response on the earnings announcement day.

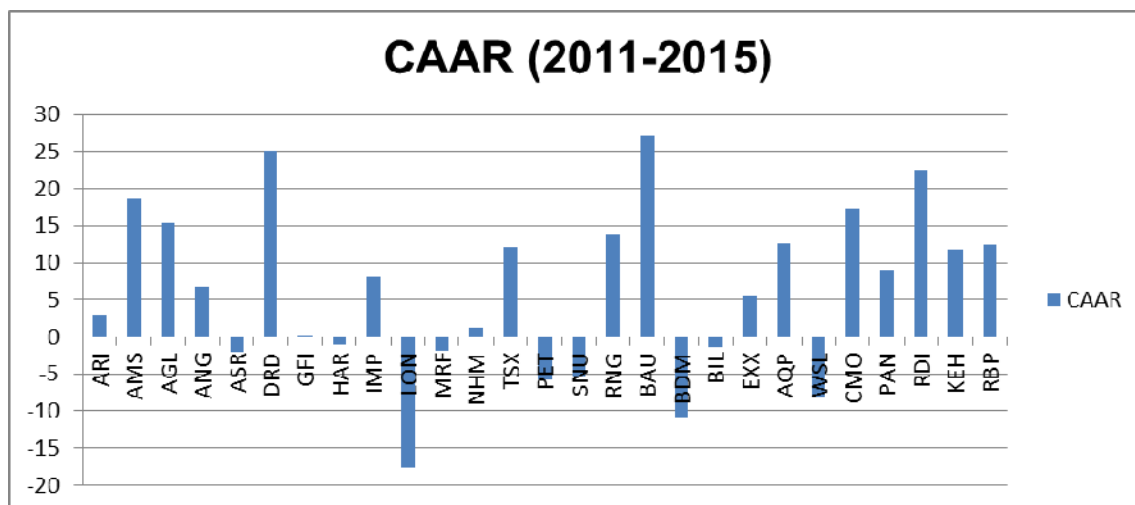
The following section presents the results and findings surrounding the calculation of the CAAR.

#### **4.5 Analysis of cumulative average abnormal returns (CAAR)**

The CAAR for each individual stock is obtained by summing up AAR over the event window. Figure 4.56 below illustrates the results calculated for the CAAR on the earnings announcement day of the 27 respective companies for the period 2011-2105.



**Figure 4.56: Event day CAAR for the sample companies for the period 2011-2015**



*Source: Author*

An observation of the results presented in figure 4.56 reveals that the CAAR tends to stay significantly positive during the event window. However, the following companies yielded interesting results:

- LON attained the lowest CAAR while BAU yielded overall the highest CAAR;
- LON attained a CAAR of -17.59% for the five year study period;
- BAU attained a CAAR of 27.07% for the five year study period; and
- The average CAAR over the full 51 day event window period was 6.23%, which may indicate an overall positive market reaction for the sample firms over the study period.

The descriptive statistics relating to the CAAR calculation is summarised in table 4.3 and table 4.4 found in appendix H. The next section relates to the hypothesis testing of the abnormal returns.

## 4.6 Hypothesis testing

As presented in the previous chapters, the testing of research hypothesis was applied in the study to facilitate the answering of the research question. When implementing a classical event study methodology, effects on share prices of certain economic events are measured by abnormal returns (AR) realised on the event window. Thus, in order to determine whether earnings announcements have an effect on the share prices of all mining companies listed on the JSE, an AR has to be present. The AR has to be either greater/smaller than zero.

The following hypothesis was stated in Chapter one:

**H<sub>0</sub>:** Abnormal returns obtained on the earnings announcement event window period will not be significantly different from zero.

**H<sub>1</sub>:** Abnormal returns obtained on the earnings announcement event window period will be significantly different from zero.

The results of the hypothesis testing will be presented and discussed in the following section.

#### 4.6.1 Results of hypothesis testing

The results relating to the hypothesis testing are presented in table 4.5 below.

**Table 4.5: Hypothesis testing t-statistics and p-value**

Code	t-stat	p-value
ARI	2.625037	0.000001
AMS	12.415660	0.000589
AGL	10.045614	0.001567
ANG	-0.120877	0.000000
ASR	-3.960952	0.000000
DRD	17.605482	0.087557
GFI	-4.566517	0.000000
HAR	0.853844	0.002561
IMP	8.886526	0.000000
LON	-12.725349	0.000000
MRF	-1.775273	0.000000
NHM	2.031005	0.000029
TSX	7.439407	0.004760
PET	-5.150316	0.000000
SNU	-7.064251	0.006769
RNG	5.464036	0.000006
BAU	5.448662	0.225044
BDM	-3.959735	0.379052
BIL	-5.803965	0.002225
EXX	1.958136	0.027657
AQP	9.282736	0.000201
WSL	-6.360925	0.213541
CMO	3.346179	0.006297
PAN	8.823081	0.008829
RDI	7.602148	0.000005
KEH	6.620032	0.025232
RBP	9.003109	0.315617

Source: Author

The critical values applied in this study were 0.10, 0.05 and 0.01 as it is used to test the confidence intervals of 90%, 95% and 99%. The overall *t-statistic* of 2.420879% was greater than 1%, but smaller than 10% and 5% and thus the null hypothesis affirming that abnormal returns obtained on the earnings announcement period event window period will not be significantly different from zero will be rejected. The *t-value* of 2.420879% indicates a positive difference between our sample data and the null hypothesis.

Table 4.5 above also indicates that the *p-values* for each of the sample companies as well as the overall calculated *p-value* (0.0484) of AR are smaller than the critical values of 0.10 and 0.05. This result indicates that the AR obtained in this study is statistically significant and accelerates the rejection of the null hypothesis. The full presentations of the hypothesis testing results are presented in table 4.6 and table 4.7 which are found in appendix I.

Table 4.9 found in appendix J reveals that CAARs over the most period of the event window are significantly positive. The results clearly show evidence of a significant positive association between cumulative abnormal returns on the days surrounding earnings announcements for the selected firms over the study period.

The following section presents a summary of the results obtained from the discussion of this chapter.

## **4.7 Summary**

This section summarises the results obtained by adopting a classical event study methodology to the data collected for this study. An analysis of AR, AAR and CAAR calculations were implemented and their results studied. The opinion of the researcher on these results follows below.

The consensus of the AR values acquired by the sample companies on the earnings announcement date shows mixed results. However, these AR values were all statistically significant. Hypothesis testing applying the *t-statistic* and *p-values* indicated that the AR values acquired are statistically significant and rejects the null hypothesis. It

can be concluded that the AR, AAR and CAAR for the sample companies on the earnings announcement were significantly different from zero.

The next chapter relates to the conclusions and recommendations formulated in this research by examining the results acquired in this chapter.

## Chapter 5

### Findings, conclusion and recommendations

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#### 5.0 Introduction

This study was undertaken to examine the impact of earnings announcements on the share price of selected JSE listed mining companies. Specifically, the study evaluated the information content and usefulness of companies' earnings announcements to investors on the JSE. If there is an impact of the earnings announcement on the share prices of selected mining companies listed on the JSE, what is the directionality of the impact, which means; does the share price increase or decrease?

The preceding chapter outlined and deliberated on the results obtained from applying a classical event study methodology to the sample data set. This chapter discusses the findings obtained from those results as well as the effect these outcomes will have on the field of research.

The layout of this chapter will be as follows: section 5.1 describes the reason for conducting the study whereas section 5.2 will present a discussion on the findings attained. The conclusion and summary of the findings will be presented in section 5.3, followed by the contribution of this study which is discussed in section 5.4. Section 5.5 discusses the limitations of this study and section 5.6 suggests the recommendations for further research. Lastly, section 5.7 presents the summary of the chapter.

#### 5.1 Reason for conducting this research

Studies conducted on the topic of share price reaction on earnings announcements are widely available, particularly in the developed economies. These include but are not limited to the research undertaken by Patell (1976) in the USA, Kong and Taghavi (2006) in China, Dimitropoulos and Asteriou (2009) in Greece, Seetharaman and Raj (2011) in Malaysia and Booth *et al.* (1997) in Germany.

However, there are few study initiatives focusing on this research field in the developing countries, especially studies that attempt to cover individual industry sectors, like mining, agriculture and finance.

The determination of AR, AAR and CAAR on the earnings announcement dates is shown by the results presented graphically in the preceding chapter. Although an overall negative market reaction on the event window period was noted on AR and AAR, the results yielded by CAAR were overall positive. These results will be discussed in the following sections.

### **5.1.1 Findings relating to abnormal returns (AR)**

The observations noted on the AR calculations on the earnings announcement dates reveal that the market seems to have a positive reaction to the earnings announcement news. These results may indicate that investors could perceive a decrease on the earnings announcement figure as a positive signal from a company, contradicting the findings obtained in studies conducted by Afego (2013) and Adelegan (2004).

Concurring with the literature mentioned above and the findings of this study, negative AR values were noted on the earnings announcement days for ARI, ANG, DRD, GFI, HAR, IMP, NHM, TSX, SNU, BIL, PAN, RDI, KEH and RBP. Based on these findings, it can be assumed that the investors might consider altering their investment strategies based on the direction of the earnings announcement. These findings were also found in the study conducted by Wang and King Phet (2012) in the Nordic Stock Market.

However, results obtained for AMS, ANG, AGL, ASR, LON, PET, RNG, BAU, BDM, EXX, AQP, WSL and CMO showed positive AR results on the earnings announcement day. These findings are shared by Rono (2013) who asserts that with respect to earnings announcement, it is possible for positive abnormal returns to be gained by trading on the month of earnings announcements.

### **5.1.2 Findings relating to average abnormal returns (AAR)**

The AAR results obtained in the calculations for each of the companies in the sample on the earnings announcement day seem to coincide with the results acquired in the AR

calculations above. These results indicate a positive market reaction to the earnings announcement news.

The findings from the following companies; ARI, ANG, GFI, HAR, IMP, LON, MRF, TSX, SNU, BAU, BIL, RDI, KEH and RBP all seem to indicate a negative AAR on the earnings announcement day. The negative AAR could be due to the negative earnings announcement news; this is in contradiction with the study conducted by Fama *et al.* (1969).

However, as noted with the AR calculations above, the following companies indicated a positive market reaction to the earnings announcement news; AMS, AGL, ASR, DRD, NHM, PET, RNG, BDM, EXX, AQP, WSL, CMO and PAN. The AAR determined on the earnings announcement day for the 27 companies on the sample is graphically illustrated in Figure 4.55 in chapter 4 of this study.

This research indicates an overall positive AAR realised on the days surrounding the earnings announcement period. Consequently, it can be concluded that the AAR follows a similar trend to the findings obtained for AR in the preceding section. The assumption is that an overall positive AAR will be acquired on the earnings announcement period.

### **5.1.3 Findings relating to cumulative average abnormal returns (CAAR)**

The overall findings for CAAR, which are graphically presented in figure 4.56, show a positive trend. The calculations were based on a sample of 27 companies (N=27). Of this number, about 67% of the total sample indicated positive results. These results supports the results obtained for AR and AAR calculations in the previous sections (section 5.1.1 and 5.1.2).

A careful observation of the results presented in table 4.9 found in appendix J reveal that ARs and CAARs tend to stay significantly positive 20 days before the announcement date. The ARs starts to drift negatively from day -6 to day -1, however both AR and CAAR show a positive result on the earnings announcement date. The negative mean CAAR was realised from day 5 until day 16. The highest positive AR of 1.3896% was on day -8 whereas CAAR was high on day -7 at 2.5020%.



The positive CAAR results obtained during the earnings announcement period is in contradiction with the study conducted by Sennanye (2015). The latter researcher argued that CAAR found on the BEE announcement event period had a negative impact on the cumulative abnormal returns of mining companies in the short term. The following companies indicated negative results; ASR, HAR, LON, MRF, PET, SNU, BDM, BIL, and WSL.

#### **5.1.4 Findings relating to hypothesis testing**

Maree, (2009) defines hypothesis testing as a process whereby researchers start by having certain ideas or beliefs about the properties of the study variables in the population. In addition, these ideas or beliefs are then tested for credibility based on data from the sample.

The following null ( $H_0$ ) and alternative ( $H_1$ ) hypotheses were tested in this research in order to facilitate answering the research question. However, for the null hypothesis to be accepted the p-value of the sample results should not be significantly different from zero. The two hypotheses' testing results are as follows:

***H<sub>0</sub>: Abnormal returns obtained on the earnings announcement event window period will not be significantly different from zero.***

Based on the findings presented in table 4.5 (Chapter 4), the above hypothesis ( $H_0$ ) is rejected. This research showed that abnormal returns (AR) obtained during the earnings announcement event window period was statistically significant as an overall *p-value* (0.0484) of AR indicates strong evidence against the null hypothesis.

***H<sub>1</sub>: Abnormal returns obtained on the earnings announcement event window period will be significantly different from zero.***

Based on the findings as presented in table 4.5 (chapter 4), the above hypothesis ( $H_1$ ) is accepted. This research showed that abnormal returns (AR) obtained during the earnings announcement event window period was statistically significant as an overall

*p-value* (0.0484) of AR indicates strong evidence in support of the alternative hypothesis.

The following paragraphs will present the discussion of the findings obtained from this research.

## **5.2 Discussion of the findings**

The results obtained from this study were attained by implementing a classical event study methodology as originally implemented in finance literature by Dolley (1933). The event study methodology adopted in this research is closely related to the methods implemented and suggested by Corrado (2011). This methodology is popular when testing the effects of economic events on the share prices of companies listed on the stock exchanges around the world.

This study was undertaken to investigate the impact of earnings announcements on the share prices of all mining companies listed on the JSE for the period 2011-2015. The research question, as stated in chapter one of this study, was targeted at determining this economic impact. The sample consisted of 27 mining companies, which entailed 135 earnings announcements events and a total of 1377 observations.

The results presented in chapter 4 looked at AR, AAR and CAAR on the earnings announcement dates. Although an overall negative market reaction on the earnings announcement day was realised on the calculations of AR and AAR, the results obtained for CAAR yielded positive outcomes. The summary of the findings will be presented in the following section.

### 5.3 Conclusion of the findings

The findings of this study are summarised in table 5.1 and table 5.2 below.

**Table 5.1: Summary of findings for this study**

Unit	Findings	Literature
Abnormal Returns (AR)	An overall positive AR was noted on the earnings announcement period, for most companies in the sample.	Contradicts the studies conducted by Afego (2013) and Mlonzi <i>et al.</i> (2011) but coincides with the research by Rono (2013).
Average Abnormal Returns (AAR)	An overall positive AAR was acquired on the earnings announcement period, coinciding with the results obtained for AR.	in contradiction with a study conducted by Bartov, Radhakrishnan and Krinsky (2000) but Coincides with the study by Wang and King Phet (2012).
Cumulative Average Abnormal Returns (CAAR)	An overall positive CAAR was achieved on the earnings announcement period, in contrast with AR and AAR results.	Coincides with the study conducted by Sennanye (2011), however in contradiction with the research by Afego (2013) who found that CAAR on the earnings announcement day will be significantly negative.

*Source: Author*

As indicated in table 5.1 above, it can be concluded that the markets performed well on average. This is based on the positive results achieved for AR , AAR, and CAAR on the earnings announcement period.

**Table 5.2: Hypotheses testing results**

Unit	Hypothesis statement	Result
H <sub>0</sub>	Abnormal returns obtained on the earnings announcement event window period will not be significantly different from zero.	Rejected
H <sub>1</sub>	Abnormal returns obtained on the earnings announcement event window period will be significantly different from zero.	Accepted

*Source: Author*

Table 5.2 above shows that the  $H_0$  hypothesis was rejected by this study and  $H_1$  was therefore accepted. The following section will highlight the contribution of this study to the finance literature.

## **5.4 Contribution of the study**

The contribution of the study undertaken by this research was to extend evidence on how the share price reacts to earnings announcements for a sample of mining companies listed on the JSE in South Africa. By knowing the impact of earnings announcements on the share prices of mining companies listed on the JSE, investors and analysts can arrange their trading strategies in a prudent manner.

The findings of this research are important to investors, decision makers, analysts, portfolio managers and other stock market participants who use earnings announcements to measure their trading opportunities (Rono, 2013). In addition, it is important to note those investors' expectations of company earnings announcements are already reflected in the share price.

Although this study highlighted the importance of analysing the impact of earnings announcements on the share prices of mining companies listed on the JSE, there were some limitations identified by this research. These limitations will be highlighted in the following section.

## **5.5 Limitations**

There are four main limitations present in this research and they are listed below:

- The research conducted in this study only focused on the impact of earnings announcement on the share prices of selected mining companies listed on the JSE. It does not test the impact of those earnings announcements on the entire JSE listed constituents.

- Dual listed companies have not been excluded from the sample; this could influence the results either in a positive or negative manner, as different countries apply different accounting rules and principles.
- This study does not seek to understand why earnings announcements might have an impact on the share prices of selected mining companies; it only seeks to determine whether there is an impact.
- This study did not take into account whether the earnings announcements were either positive or negative, for example by comparing the current year and previous year's earnings figures.

## **5.6 Recommendations for future research**

This study was undertaken to investigate the impact of earnings announcements on the share prices of all mining companies listed on the JSE. Therefore, only the impact of the earnings announcements was investigated and not why the earnings announcement affected the share price.

Although the literature concerning the impact of earnings announcement on share prices were briefly discussed in this study, it was not empirically tested. Recommendations for future research are as follows:

- This study focused on all mining companies listed on the JSE, including those also listed on other stock exchanges around the world - a different study could be undertaken to eliminate the dual listing effect.
- In this research, the analysis did not take into account the directionality of the announcement, which means the study did not test whether the announcement was positive/negative in comparison with previous years. Another study could be undertaken focusing only on the companies that announced positive/negative earnings results.
- Lastly, the researcher contemplates to conduct a follow-up study by identifying the main drivers of share price movement on the JSE listed mining companies. The study would benefit potential investors, analysts and shareholders of companies to assess the potential growth of a particular company.

## 5.7 Summary

This research was undertaken to achieve the following objectives namely; to evaluate the impact of earnings announcements on the share price of selected mining companies listed on the JSE; and to determine the behaviour of the share price twenty five (25) days before announcement, on the day of the announcement and twenty five (25) days after the earnings announcements of mining companies listed on JSE

To achieve the above-mentioned objectives, it was the researcher's assumption that the abnormal returns arising from earnings announcements will not be significantly different from zero. This is because new information contained in earnings announcements is quickly reflected in the share price, therefore not allowing for statistically significant abnormal returns to be generated on the basis of trading on the month of the announcement only.

Nevertheless, the purpose of this study was not to determine why earnings announcements have a certain impact on the share prices of companies, but rather to investigate what the impact would be. More specifically, what the impact of earnings announcement is on the share prices of mining companies operating in the South African market.

The consensus reached by the results obtained in this study indicates that the AR, AAR and CAAR portrayed a positive reaction of the share price during the earnings announcement event window period. These results were in contradiction with the findings by Afego (2013), Mlonzi *et al.* (2011) and Bartov *et al.* (2000). However, the calculations relating to the AR, AAR and CAAR were coinciding with the study by Sennanye (2011).

It can be concluded that earnings announcements news were followed by positive mixed results reflected on the share prices of mining companies listed on the JSE. However, the AR, AAR and CAAR obtained during the earnings announcement event window period will be significantly different from zero. These findings were proved by the results obtained from the t-tests and the p-value figures found from the researcher's computations.

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# APPENDICES

## Appendix A: Ethical clearance certificate



**UNISA** | university of south africa

**COLLEGE OF ACCOUNTING SCIENCES  
RESEARCH ETHICS REVIEW COMMITTEE**

Date: 8 June 2016

Ref: 2016\_CAS\_034  
Name of applicant: Mr P Maraisane  
Student/Staff #: 90163044

Dear Mr P Maraisane

**Decision: Ethics Approval**

---

**Name:** Mr P Maraisane  
Maraip1@unisa.ac.za

**Title of research project:** The impact of earnings announcements on share prices of mining companies listed on the Johannesburg Stock Exchange.


**Purpose:** Postgraduate student research

Thank you for the application for research ethics clearance by the College of Accounting Sciences Research Ethics Review Committee for the above mentioned research. Final approval is granted for the completion of the research.

**For full approval:** The secondary data research application was reviewed in compliance with the Unisa Policy on Research Ethics by the College of Accounting Sciences Research Ethics Review Committee on 7 June 2016.

The proposed research may now commence with the provision that:

- 1) The researcher/s will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
- 2) Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study, as well as changes in the methodology, should be communicated in writing to the College of Accounting Sciences Research Ethics Review Committee. An amended application could be requested if there are substantial changes from the existing proposal, especially if those changes affect any of the study-related risks for the research participants.
- 3) The researcher will ensure that the research project adheres to any applicable



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Open Rubric

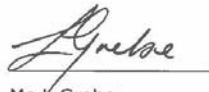


*national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study.*

**Note:**

*The reference number [top right corner of this communiqué] should be clearly indicated on all forms of communication [e.g. Webmail, E-mail messages, letters] with the intended research participants, as well as with the College of Accounting Sciences RERC.*

Kind regards,



Ms L Grebe  
(Chairperson of CAS RERC)  
grebel@unisa.ac.za  
(012) 429 4994



Prof Elmarie Sadler  
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## Appendix B: Scoring principles for the elements of the charter

ELEMENT	SCORING PRINCIPLE
1. <b>Reporting</b>	Determination of percentage of companies that have reported. Scoring is Yes if the company has reported and No if the company has not reported.
2. <b>Ownership</b>	<p>Category 1: Equal or greater than 26% HDSA ownership credits, but does not have all three identifiable beneficiaries i.e. Entrepreneurs, ESOPS &amp; Communities.</p> <p>Category 2: Equal or greater than 26% HDSA ownership credits and broad-based, but no trickle cash flow to HDSA.</p> <p>Category 2+: Equal or greater than 26% HDSA ownership, broad-based, with reported trickle cash flow to HDSA.</p> <p>Category 3: HDSA ownership below 26%.</p>
3. <b>Housing and Living Conditions</b>	<p>The Mining Charter has set a target of 100% conversion of hostels using the following measures:</p> <ul style="list-style-type: none"> <li>- Reduction in occupancy to one person per room by 2014.</li> <li>- Conversion of hostels into family units by 2014.</li> </ul> <p>If progress achieved is 100%, then the score is YES If progress achieved is less than 100%, then score is NO.</p>
4. <b>Procurement</b>	Calculation of percentage expenditure from BEE entities on capital goods, services and consumables, respectively. 2014 targets for Capital goods = 40%, Services = 70%, Consumables = 50% and 0.5% of annual spend on procurement from multinational suppliers
5. <b>Employment Equity</b>	Calculation of percentage HDSA representation demographics at levels specified by the Charter. 2014 targets for Top Management = 40%, Senior Management = 40%, Middle Management = 40%, Junior Management = 40% and Core Skills = 40%
6. <b>Human Resource Development</b>	Calculation of percentage payroll expenditure on training as per target. 2014 target is 5% of total annual payroll (excluding mandatory skills development levies) to be spent on HRD
7. <b>Mine Community Development</b>	The element measures progress against implementation of mine community project commitments by December 2014
8. <b>Sustainable Development</b>	Calculation of percentage implementation of the tripartite plan on mine health and safety approved EMPs and utilisation of SA facilities for analysis of samples. 2014 targets are EMPs = 100%, Tripartite Action Plan = 100% and Percentage of samples in South African facilities = 100%

*Source: Department of mineral resources (2014)*

## **Appendix C: Benefits of listing on the JSE**

The following information is supplied for the benefit of the board of directors in order for them to consider the various aspects of listing.

### **Main advantages**

- The listing process, which necessitates a valuation of the company requiring input from management, is beneficial to the company, as management is simultaneously required to focus on defining the company's strategic direction.
- Should the company require further capital, it is able to raise funds via a private placement, preferential offer, public offer, a rights issue or a combination thereof, which will immediately strengthen the balance sheet.
- Existing shareholders are often able to benefit financially through the repayment of shareholder loans or the realisation of a portion of their shareholdings at the date of listing or shortly thereafter.
- The company's shares are traded in a regulated market, thereby establishing a daily share pricing mechanism, which measures the company's value on an ongoing basis.
- Acquisitions of assets are facilitated through the issue of new shares or other securities. A well-rated company will trade on a high price-earnings ratio, which enables the relatively 'cheap' acquisition of assets when shares are issued in consideration.
- Mergers and joint ventures with other listed and unlisted companies are more easily implemented.
- The raising of funds via rights offers or, where possible, the issue of shares for cash is more readily implemented than for an unlisted company.
- A listing lends a certain transparency to the company's business affairs, which is looked upon favourably by all of the company's stakeholders, including creditors, bankers, shareholders, employees and customers, and usually results in improved credit ratings and financing availability.
- Relations with international and national business interests are likely to improve due to the perception that the company has nothing to hide, as evidenced by its willingness to list and subject itself to public scrutiny.
- The establishment of a share incentive scheme provides motivation for the employees to add value to the business, thereby increasing their own wealth through an increased share price.

### **Main disadvantages**

- The company must comply fully and at all times with the rules and regulations of the JSE and the Securities Regulation Panel (SRP), and the requirements of the Companies Act (No. 61 of 1973), as amended, which requires the input of both management and the company's advisors, and may lead to the consequent generation of large volumes of documentation.
- Initial listing costs, although one-off, are high.

- The company is exposed to public scrutiny, resulting in increased media interest and greater outside demands on management time.
- The company must seek JSE, SRP and, where necessary, shareholder approval for substantial future acquisitions, disposals, issues of shares, etc.
- The company is subject to more vigorous financial reporting requirements.
- A company with a wide shareholder spread is vulnerable to a hostile takeover.
- The costs of appointing transfer secretaries, printing financial statements and paying advisors' fees can prove to be significant.
- Shareholder control is usually diluted from the date of listing.

### **Methods of achieving a listing**

The following methods of achieving a listing are available:

- A. A listing whereby application is made for an initial listing of the entire issued ordinary share capital of a company or a part thereof. In this instance, the following alternatives are available to a company:
  - An introductory listing where no capital is raised and the company satisfies the JSE spread requirements requires a pre-listing statement.
  - A listing combined with either the raising of capital or the offer of shares for sale. The following options are available to the company:
    - A public offer only – requires the preparation and registration of a prospectus.
    - A private placing only – requires the preparation and registration of a prospectus.
    - A combined public offer and preferential offer – requires the preparation and registration of a prospectus.
    - An offer of sale of shares – requires the preparation and registration of a prospectus.
  
- B. A listing whereby a listed company, usually a cash shell, acquires assets in consideration for the issue of shares resulting in a change of control and an offer to minority shareholders. A revised listing particulars statement is required as well as a circular to shareholders. The listing criteria for the assets injected into the listed vehicle are the same as for a direct listing.

## Appendix D: Human Development Index countries and ranks, 2014

### HDI countries and ranks, 2014

Country	Rank	Country	Rank	Country	Rank
Norway	1	Trinidad and Tobago	64	Namibia	126
Australia	2	Seychelles	64	Guatemala	128
Switzerland	3	Serbia	66	Tajikistan	129
Denmark	4	Cuba	67	India	130
Netherlands	5	Lebanon	67	Honduras	131
Ireland	6	Costa Rica	69	Bhutan	132
Germany	6	Iran (Islamic Republic of)	69	Timor-Leste	133
United States	8	Venezuela (Bolivarian Republic of)	71	Syrian Arab Republic	134
Canada	9	Turkey	72	Vanuatu	134
New Zealand	9	Sri Lanka	73	Congo	136
Singapore	11	Mexico	74	Kiribati	137
Hong Kong, China (SAR)	12	Brazil	75	Equatorial Guinea	138
Liechtenstein	13	Georgia	76	Zambia	139
Sweden	14	Saint Kitts and Nevis	77	Ghana	140
United Kingdom	14	Azerbaijan	78	Lao People's Democratic Republic	141
Iceland	16	Grenada	79	Bangladesh	142
Korea (Republic of)	17	Jordan	80	Cambodia	143
Israel	18	Ukraine	81	Sao Tome and Principe	143
Luxembourg	19	The former Yugoslav Republic of Macedonia	81	Nepal	145
Japan	20	Algeria	83	Kenya	145
Belgium	21	Peru	84	Pakistan	147
France	22	Albania	85	Myanmar	148
Austria	23	Armenia	85	Angola	149
Finland	24	Bosnia and Herzegovina	85	Swaziland	150
Slovenia	25	Ecuador	88	Tanzania (United Republic of)	151
Spain	26	Saint Lucia	89	Nigeria	152
Italy	27	China	90	Cameroon	153
Czech Republic	28	Fiji	90	Madagascar	154
Greece	29	Mongolia	90	Zimbabwe	155
Estonia	30	Thailand	93	Mauritania	156
Brunei Darussalam	31	Dominica	94	Solomon Islands	156
Cyprus	32	Libya	94	Papua New Guinea	158
Qatar	32	Tunisia	96	Comoros	159
Andorra	34	Colombia	97	Yemen	160
Slovakia	35	Saint Vincent and the Grenadines	97	Lesotho	161
Poland	36	Jamaica	99	Togo	162
Malta	37	Tonga	100	Haiti	163
Lithuania	37	Belize	101	Uganda	163
Saudi Arabia	39	Dominican Republic	101	Rwanda	163
Argentina	40	Suriname	103	Benin	166
United Arab Emirates	41	Maldives	104	Sudan	167

Country	Rank	Country	Rank	Country	Rank
Chile	42	Samoa	105	Djibouti	168
Portugal	43	Botswana	106	South Sudan	169
Hungary	44	Moldova (Republic of)	107	Senegal	170
Bahrain	45	Egypt	108	Afghanistan	171
Latvia	46	Turkmenistan	109	Côte d'Ivoire	172
Croatia	47	Gabon	110	Malawi	173
Kuwait	48	Indonesia	110	Ethiopia	174
Montenegro	49	Paraguay	112	Gambia	175
Belarus	50	Palestine, State of	113	Congo (Democratic Republic of the)	176
Russian Federation	50	Uzbekistan	114	Liberia	177
Oman	52	Philippines	115	Guinea-Bissau	178
Romania	52	El Salvador	116	Mali	179
Uruguay	52	Viet Nam	116	Mozambique	180
Bahamas	55	South Africa	116	Sierra Leone	181
Kazakhstan	56	Bolivia (Plurinational State of)	119	Guinea	182
Barbados	57	Kyrgyzstan	120	Burkina Faso	183
Antigua and Barbuda	58	Iraq	121	Burundi	184
Bulgaria	59	Cabo Verde	122	Chad	185
Panama	60	Micronesia (Federated States of)	123	Eritrea	186
Palau	60	Guyana	124	Central African Republic	187
Malaysia	62	Nicaragua	125	Niger	188
Mauritius	63	Morocco	126		

**Source:** UNDP Human Development Report, 2015

## Appendix E: List of sample companies with their earnings announcement dates

### Listed Mining Companies publication of results dates 2011 - 2015

No	Company name	Code	2011	2012	2013	2014	2015
1	AFRICAN RAINBOW MINERALS LTD	ARI	31/08/2011	03/09/2012	02/09/2013	04/09/2014	04/09/2015
2	ANGLO AMERICAN PLATINUM LTD	AMS	13/02/2012	04/02/2013	03/02/2014	09/02/2015	08/02/2016
3	ANGLO AMERICAN PLC	AGL	13/02/2012	15/02/2013	14/02/2014	09/02/2015	16/02/2016
4	ANGLOGOLD ASHANTI LTD	ANG	15/02/2012	20/02/2013	19/02/2014	23/02/2015	22/02/2016
5	ASSORE LTD	ASR	25/08/2011	03/09/2012	28/08/2013	03/09/2014	26/08/2015
6	DRDGOLD LTD	DRD	29/08/2011	28/08/2012	23/08/2013	02/09/2014	01/09/2015
7	GOLD FIELDS LTD	GFI	17/02/2012	14/02/2013	13/02/2014	12/02/2015	18/02/2016
8	HARMONY GOLD MINING COMPANY LTD	HAR	15/08/2011	16/08/2012	14/08/2013	14/08/2014	18/08/2015
9	IMPALA PLATINUM HOLDINGS LTD	IMP	25/08/2011	23/08/2012	29/08/2013	28/08/2014	03/09/2015
10	LONMIN PLC	LON	14/11/2011	09/11/2012	11/11/2013	10/11/2014	09/11/2015
11	MERAPE RESOURCES LTD	MRF	06/03/2012	05/03/2013	11/03/2014	03/03/2015	08/03/2016
12	NORTHAM PLATINUM LTD	NHM	18/08/2011	24/08/2012	15/08/2013	14/08/2014	20/08/2015
13	TRANS HEX GROUP LTD	TSX	02/06/2011	01/06/2012	03/06/2013	02/06/2014	01/06/2015
14	PETMIN LTD	PET	13/09/2011	19/09/2012	30/09/2013	11/09/2014	08/09/2015
15	SENTULA MINING LTD	SNU	15/06/2011	14/06/2012	27/06/2013	26/06/2014	24/06/2015
16	RANDGOLD & EXPLORATION COMPANY	RNG	29/03/2012	25/03/2013	24/03/2014	24/03/2015	23/03/2016
17	BAUBA PLATINUM LTD	BAU	29/09/2011	28/09/2012	30/09/2013	22/09/2014	19/08/2015
18	BUILDMAX LTD	BDM	30/05/2011	24/05/2012	20/05/2013	19/05/2014	29/05/2015
19	BHP BILLITON PLC	BIL	24/08/2011	22/08/2012	20/08/2013	19/08/2014	25/08/2015
20	EXXARO RESOURCES LTD	EXX	23/02/2012	07/03/2013	06/03/2014	05/03/2015	03/03/2016
21	AQUARIUS PLATINUM LTD	AQP	11/08/2011	08/08/2012	08/08/2013	07/08/2014	12/08/2015
22	WESCOAL HOLDINGS LTD	WSL	29/06/2011	20/06/2012	24/06/2013	24/06/2014	23/06/2015
23	CHROMETCO LTD	CMO	31/05/2011	11/05/2012	29/05/2013	30/05/2014	29/05/2015
24	PAN AFRICAN RESOURCES PLC	PAN	12/09/2011	27/09/2012	17/09/2013	16/09/2014	16/09/2015
25	ROCKWELL DIAMONDS INCORPORATED	RDI	31/05/2011	25/05/2012	24/05/2013	23/05/2014	29/05/2015
26	KEATON ENERGY HOLDINGS LTD	KEH	22/06/2011	30/05/2012	12/06/2013	25/06/2014	24/06/2015
27	ROYAL BAFOKENG PLATINUM LTD	RBP	28/02/2012	05/03/2013	04/03/2014	03/03/2015	01/03/2016

Source: JSE Website, 2016

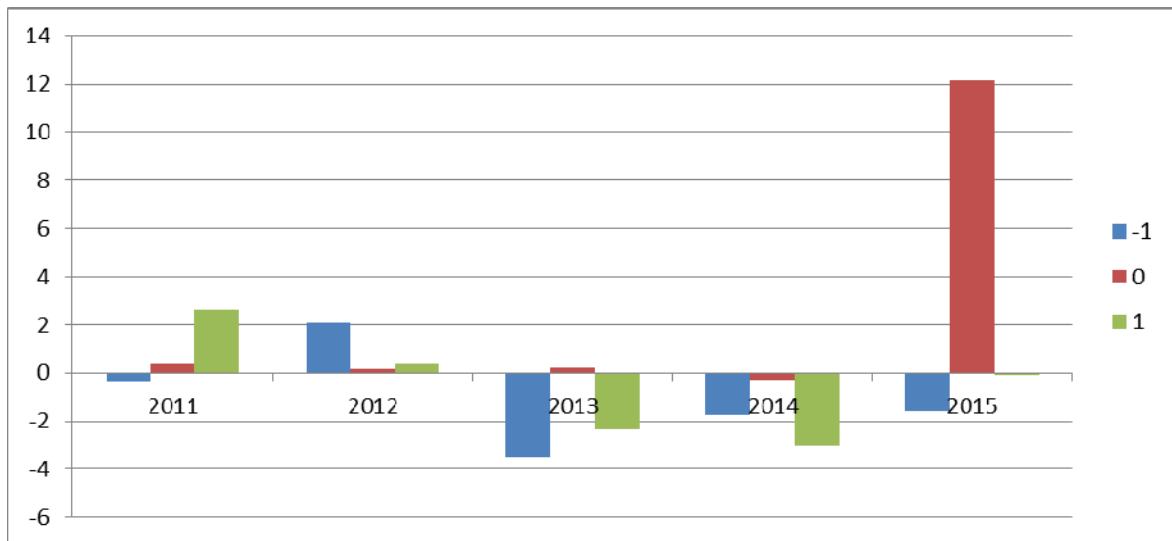
**Appendix F: Three day event window results of the Abnormal Returns (AR) for the sample companies**

**Figure 4.57: AR during a three day event window for ARI for the period 2011-2015**



source: Author

**Figure 4.58: AR during a three day event window for AMS for the period 2011-2015**

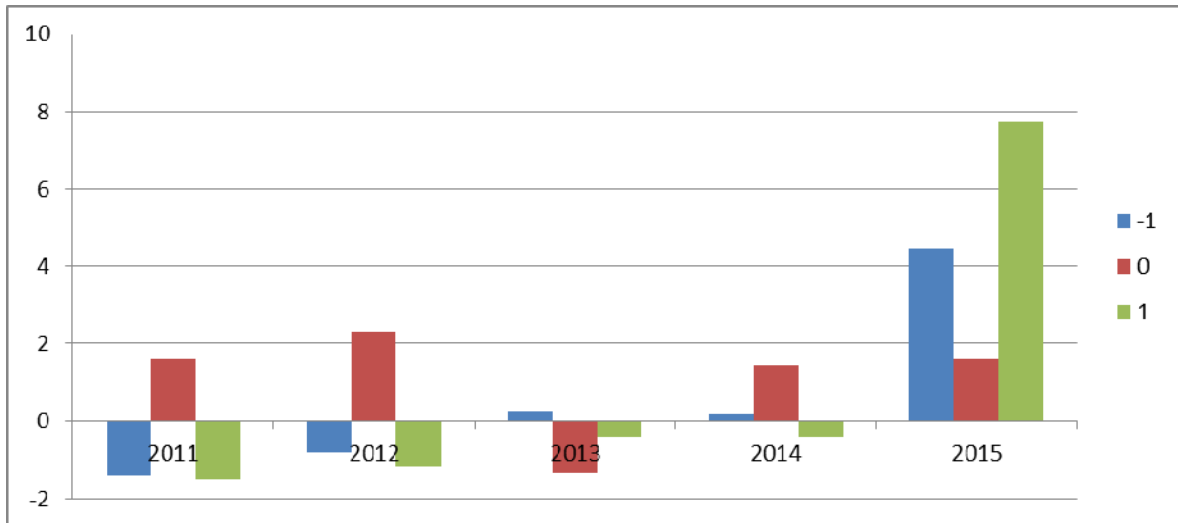


source: Author



**Appendix F: Three day event window results of the Abnormal Returns (AR) for the sample companies**

**Figure 4.59: AR during a three day event window for AGL for the period 2011-2015**



source: *Author*

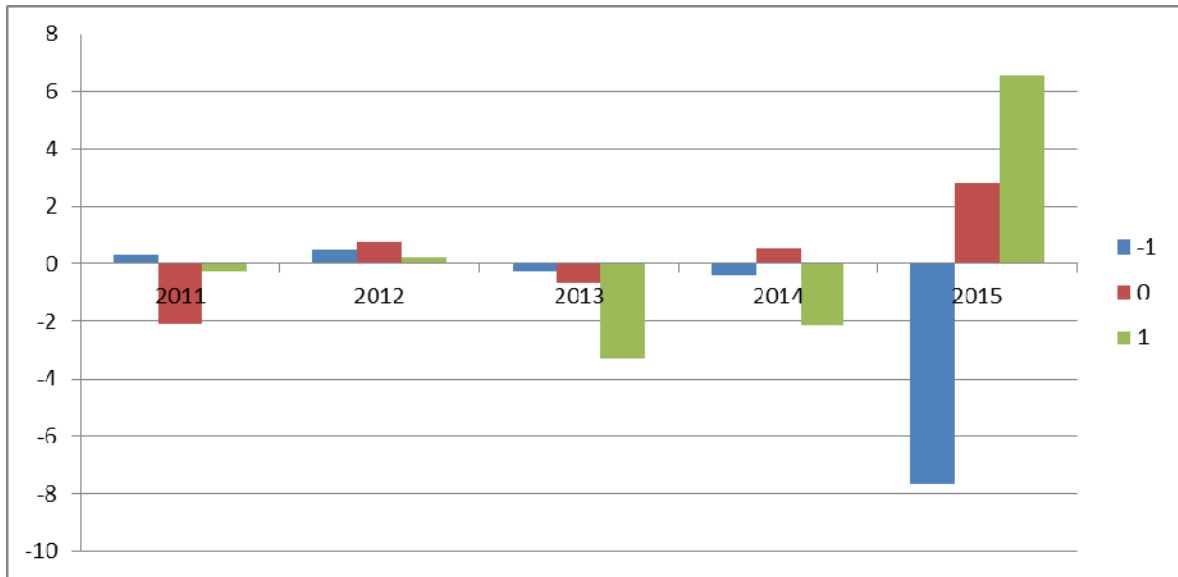
**Figure 4.60: AR during a three day event window for ANG for the period 2011-2015**



source: *Author*

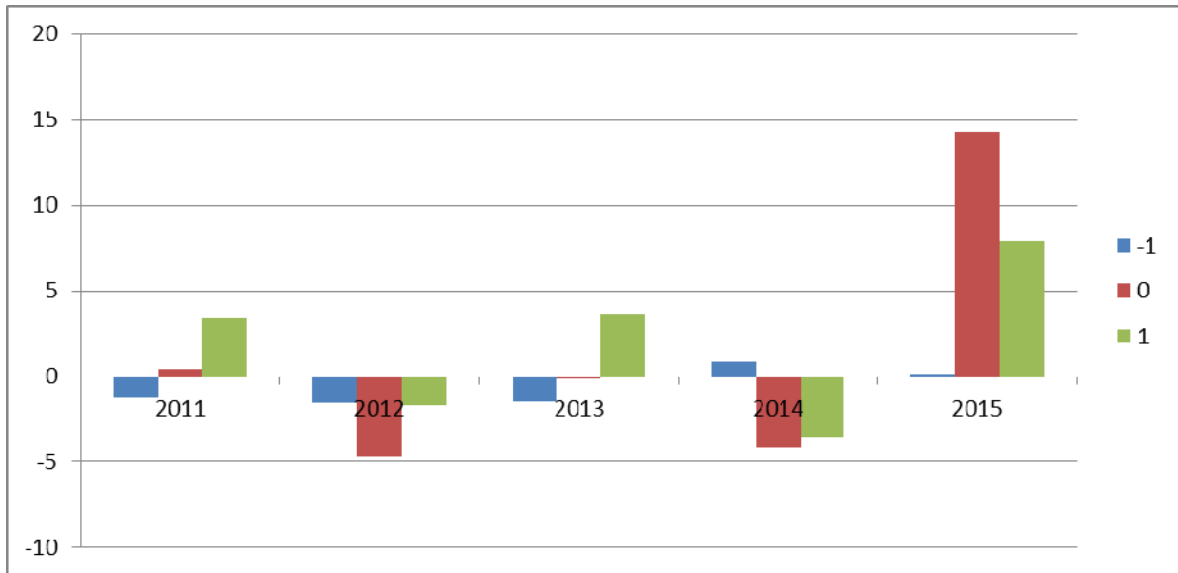
**Appendix F: Three day event window results of the Abnormal Returns (AR) for the sample companies**

**Figure 4.61: AR during a three day event window for ASR for the period 2011-2015**



source: Author

**Figure 4.62: AR during a three day event window for DRD for the period 2011-2015**



source: Author

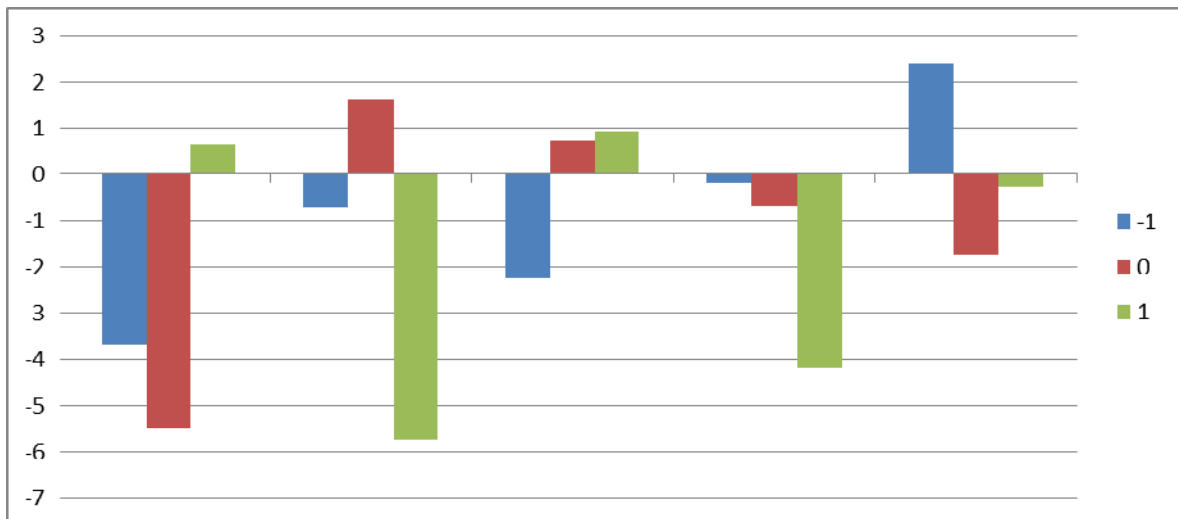
**Appendix F: Three day event window results of the Abnormal Returns (AR) for the sample companies**

**Figure 4.63: AR during a three day event window for GFI for the period 2011-2015**



source: *Author*

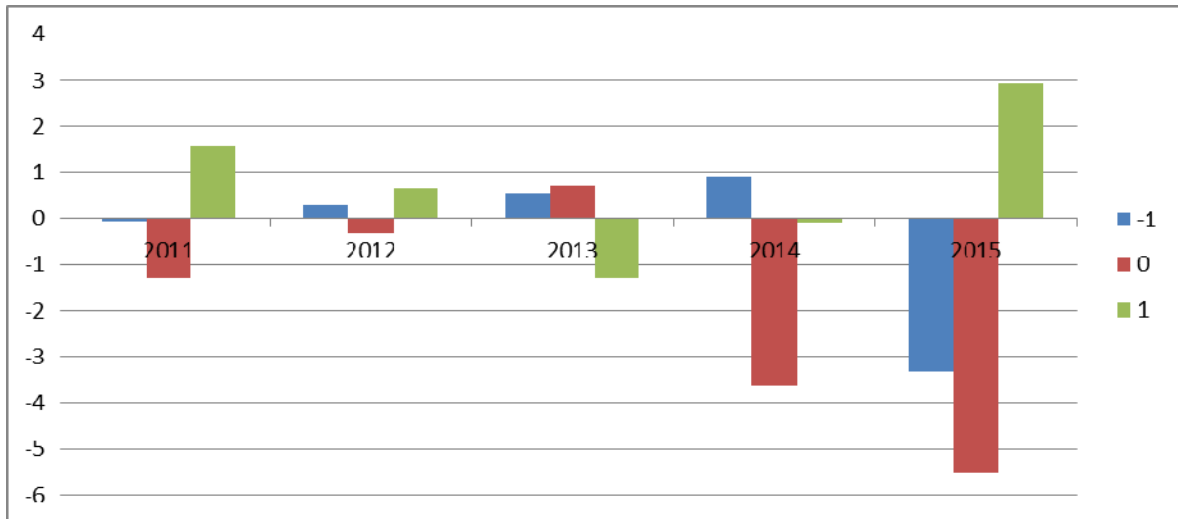
**Figure 4.64: AR during a three day event window for HAR for the period 2011-2015**



source: *Author*

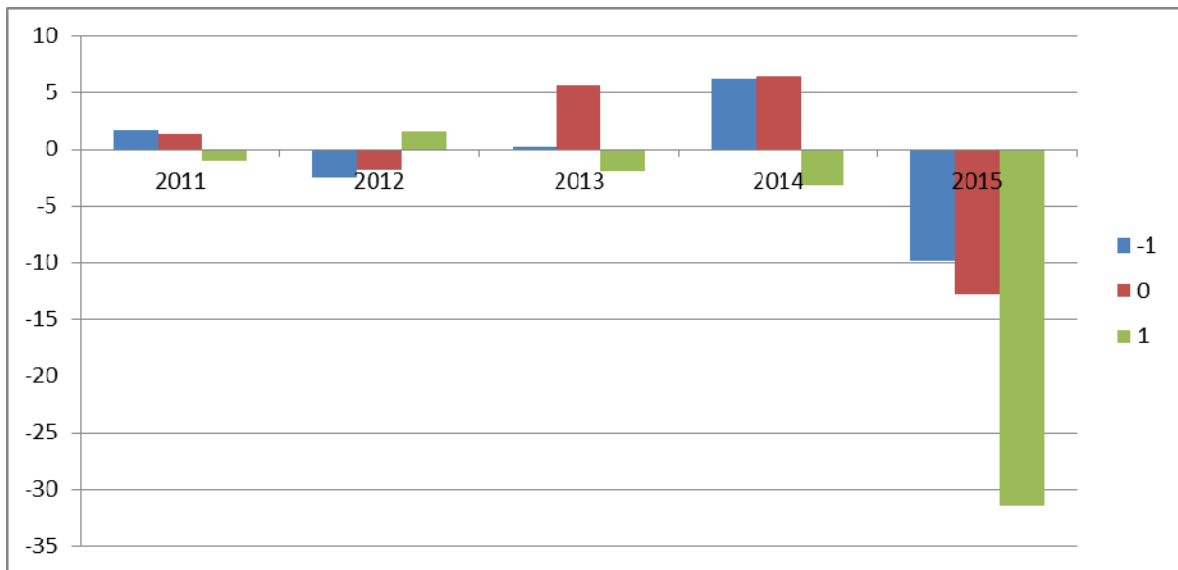
**Appendix F: Three day event window results of the Abnormal Returns (AR) for the sample companies**

**Figure 4.65: AR during a three day event window for IMP for the period 2011-2015**



source: Author

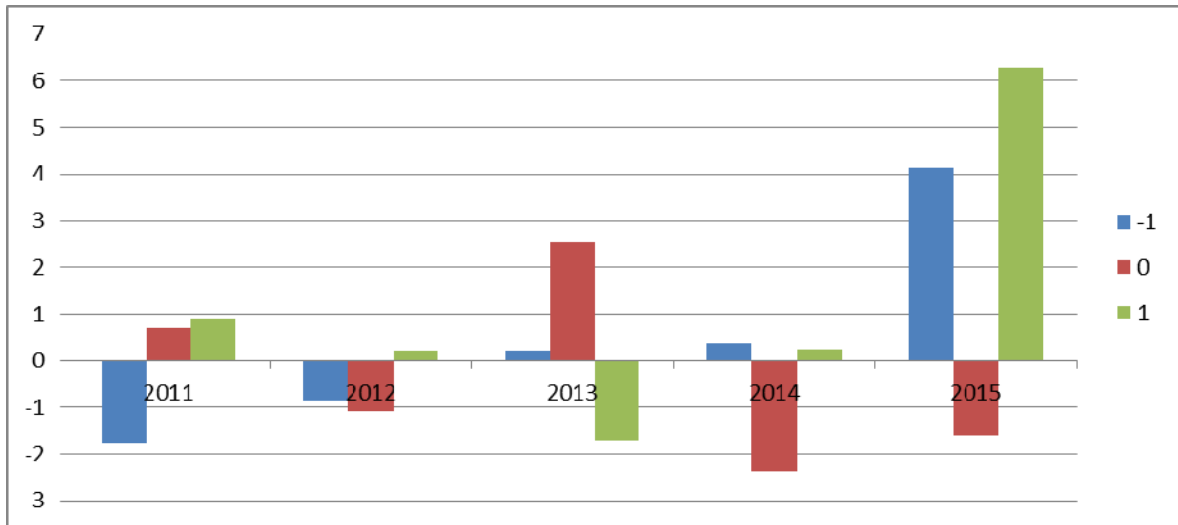
**Figure 4.66: AR during a three day event window for LON for the period 2011-2015**



source: Author

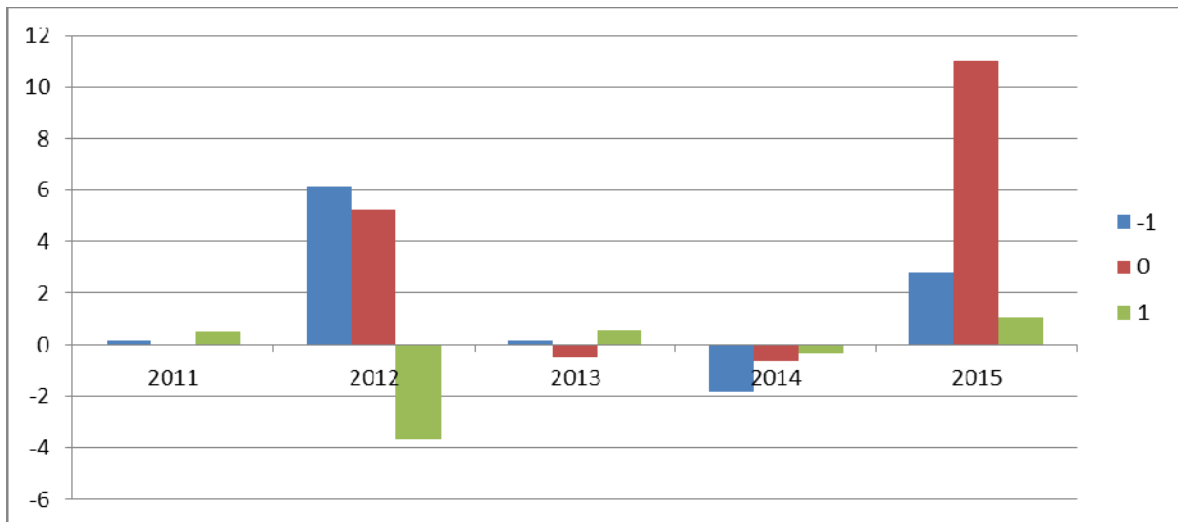
**Appendix F: Three day event window results of the Abnormal Returns (AR) for the sample companies**

**Figure 4.67: AR during a three day event window for MRF for the period 2011-2015**



source: Author

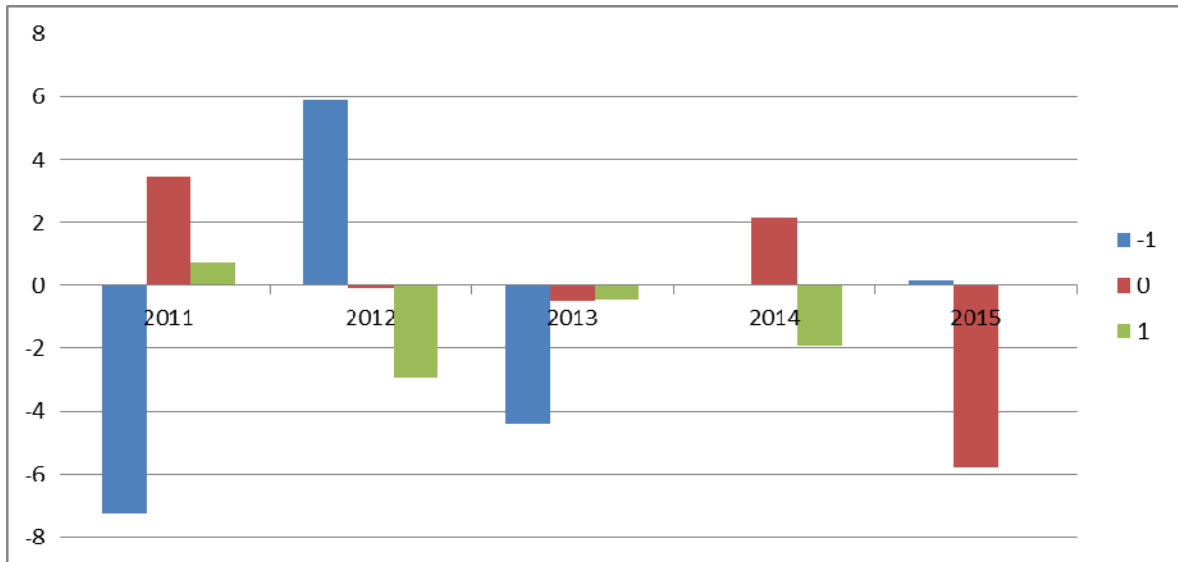
**Figure 4.68: AR during a three day event window for NHM for the period 2011-2015**



source: Author

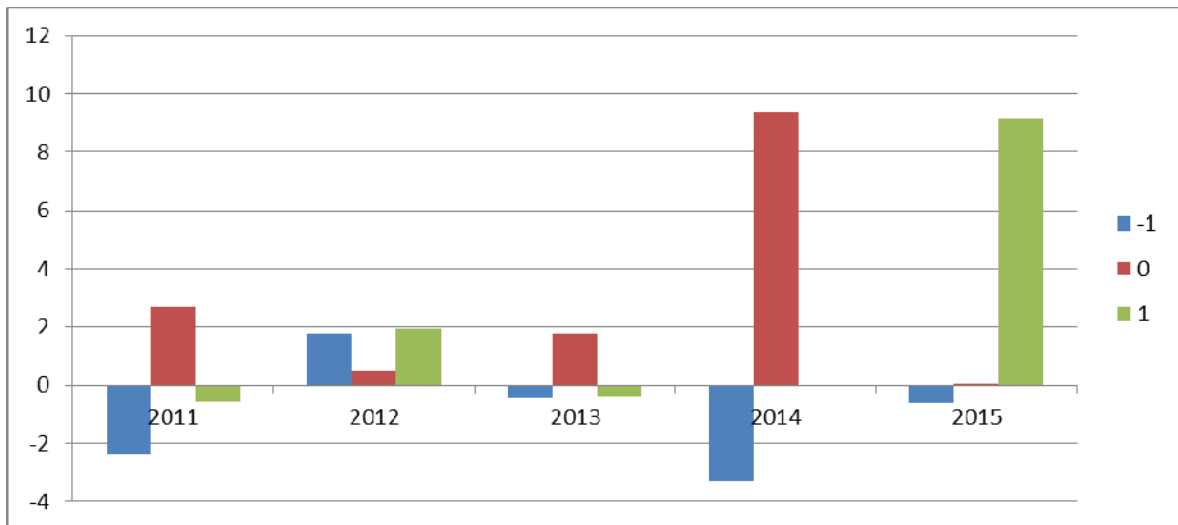
**Appendix F: Three day event window results of the Abnormal Returns (AR) for the sample companies**

**Figure 4.69: AR during a three day event window for TSX for the period 2011-2015**



source: Author

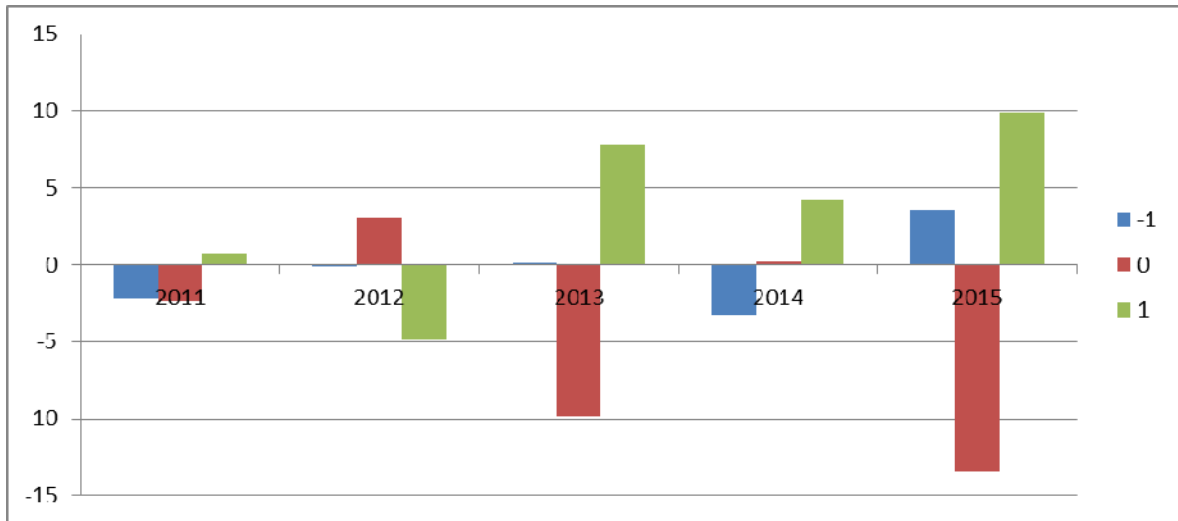
**Figure 4.70: AR during a three day event window for PET for the period 2011-2015**



source: Author

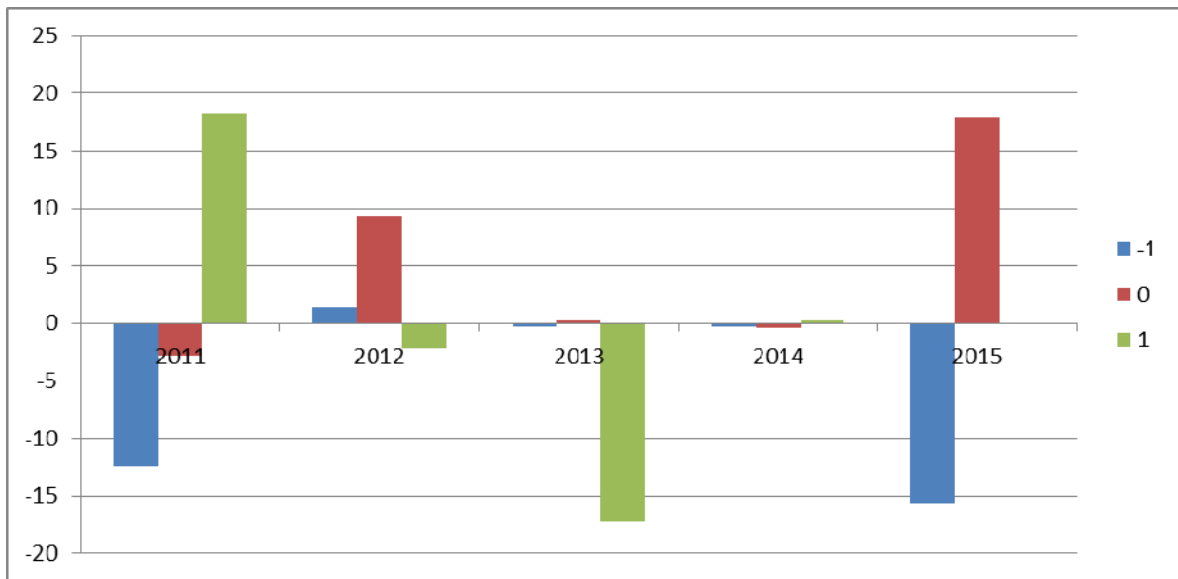
**Appendix F: Three day event window results of the Abnormal Returns (AR) for the sample companies**

**Figure 4.71: AR during a three day event window for SNU for the period 2011-2015**



source: Author

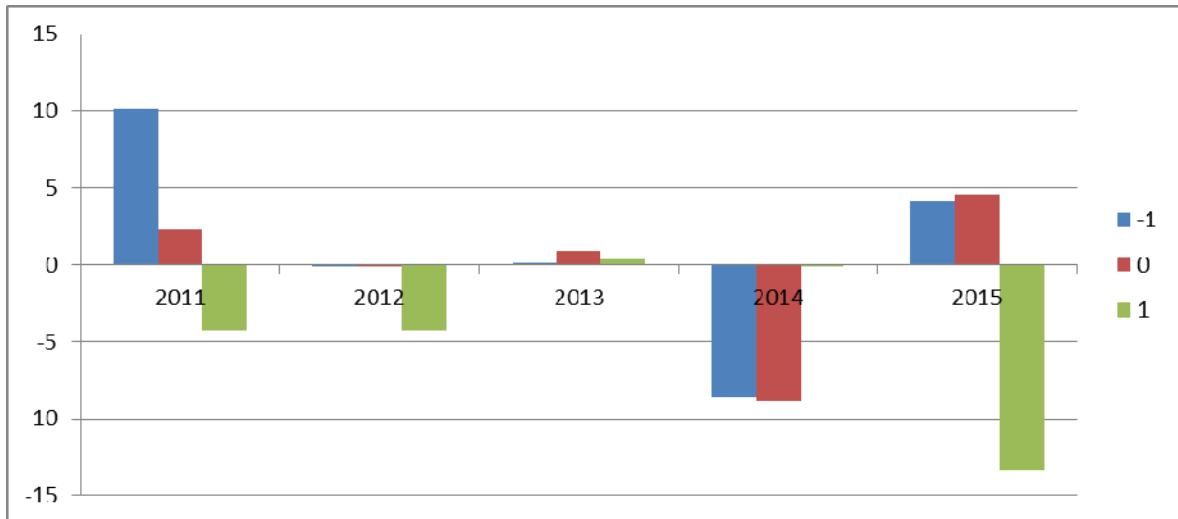
**Figure 4.72: AR during a three day event window for RNG for the period 2011-2015**



source: Author

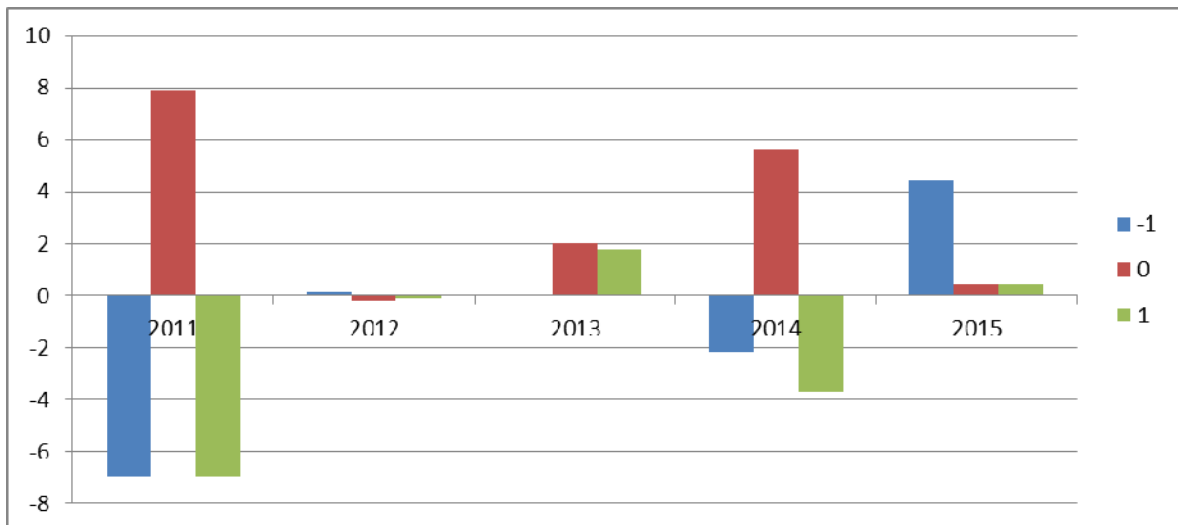
**Appendix F: Three day event window results of the Abnormal Returns (AR) for the sample companies**

**Figure 4.73: AR during a three day event window for BAU for the period 2011-2015**



source: *Author*

**Figure 4.74: AR during a three day event window for BDM for the period 2011-2015**

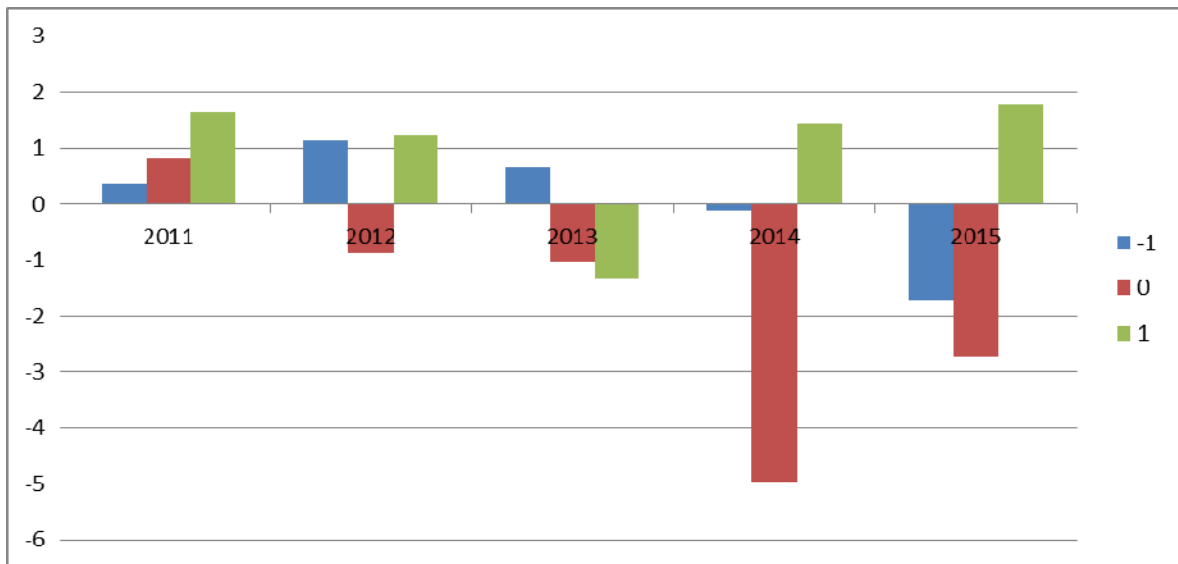


source: *Author*



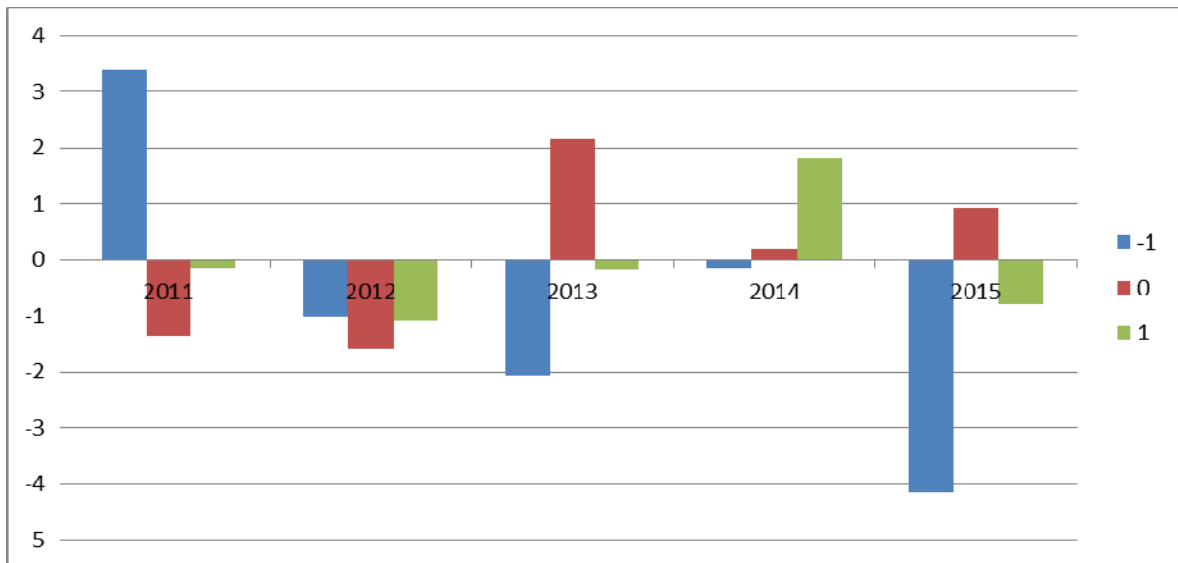
**Appendix F: Three day event window results of the Abnormal Returns (AR) for the sample companies**

**Figure 4.75: AR during a three day event window for BIL for the period 2011-2015**



source: *Author*

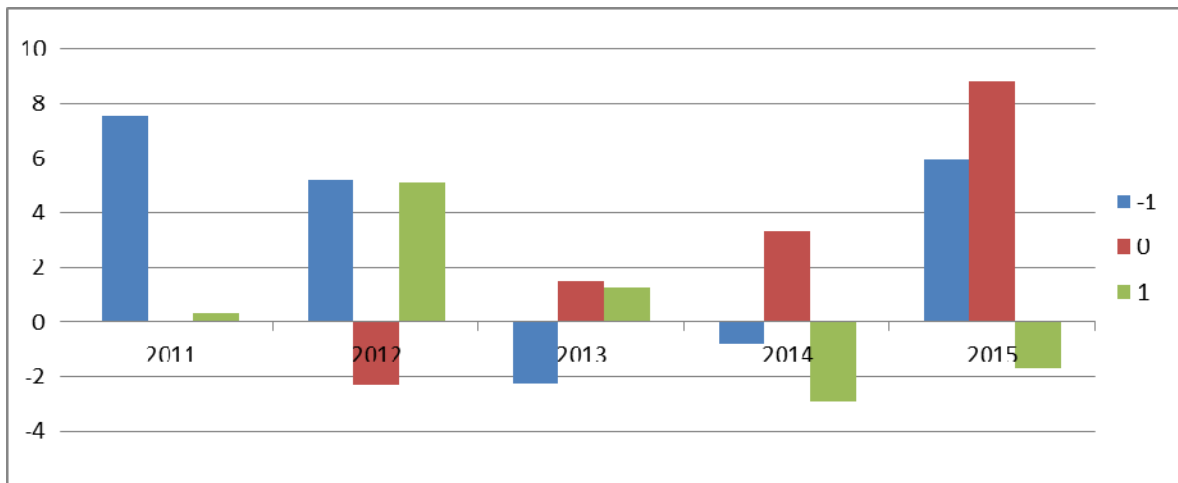
**Figure 4.76: AR during a three day event window for EXX for the period 2011-2015**



source: *Author*

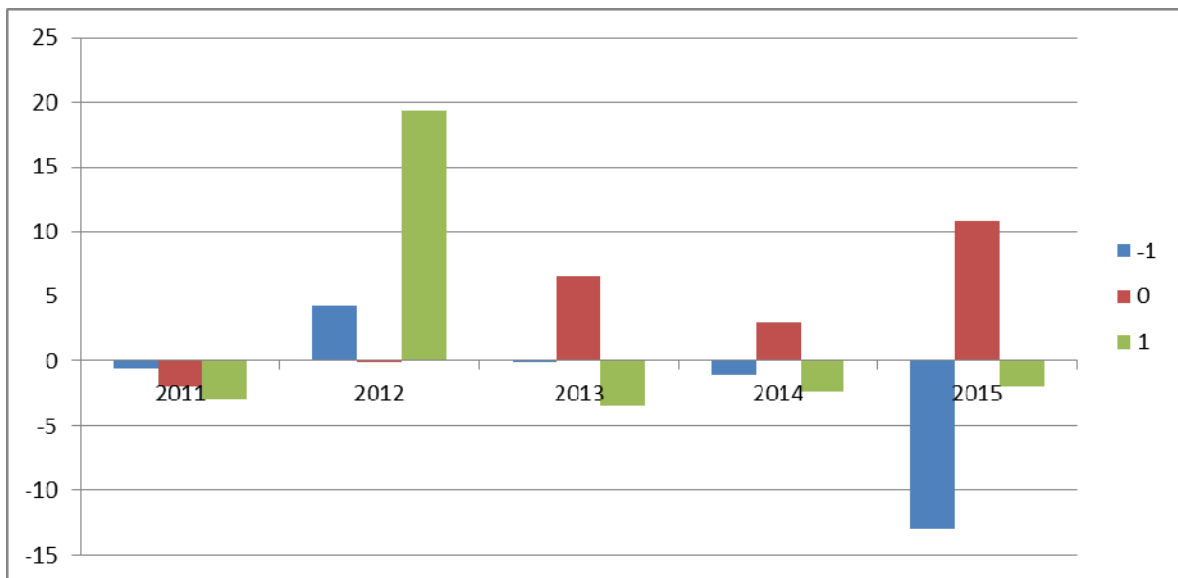
**Appendix F: Three day event window results of the Abnormal Returns (AR) for the sample companies**

**Figure 4.77: AR during a three day event window for AQP for the period 2011-2015**



source: Author

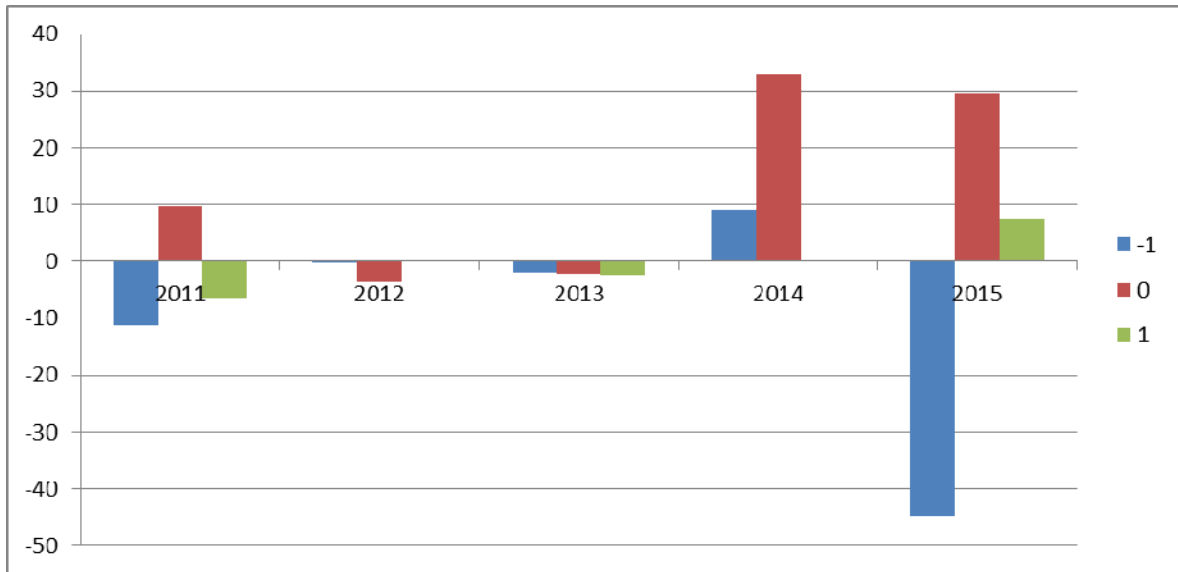
**Figure 4.78: AR during a three day event window for WSL for the period 2011-2015**



source: Author

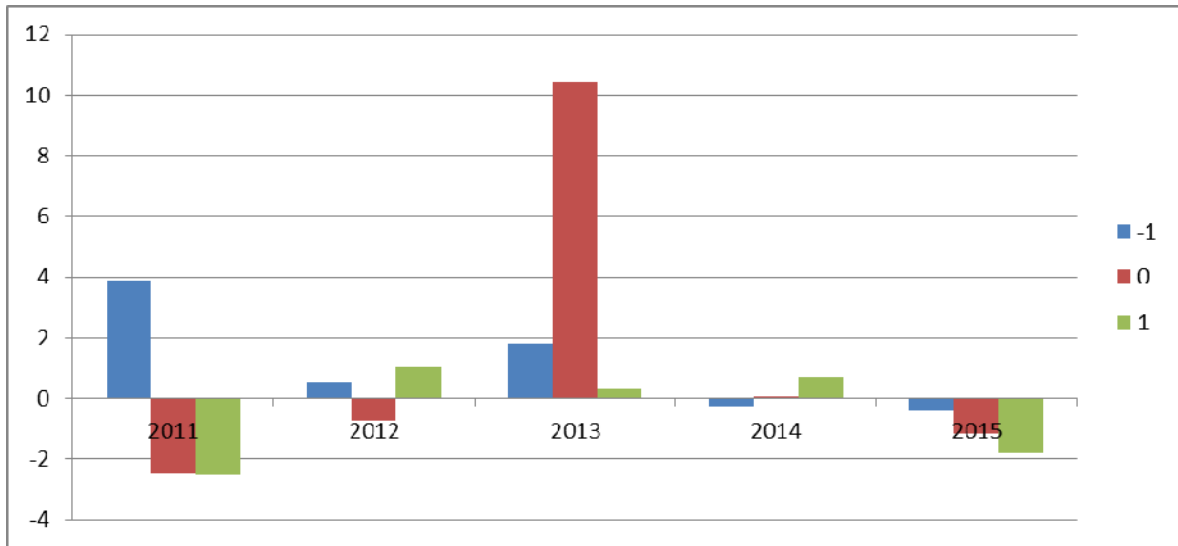
**Appendix F: Three day event window results of the Abnormal Returns (AR) for the sample companies**

**Figure 4.79: AR during a three day event window for CMO for the period 2011-2015**



source: Author

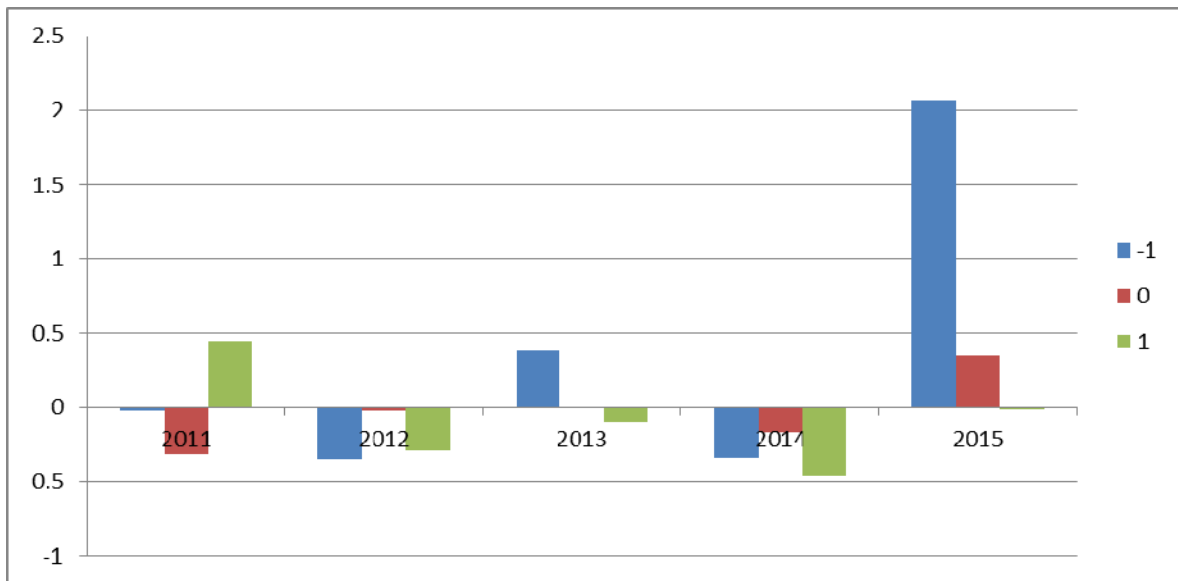
**Figure 4.80: AR during a three day event window for PAN for the period 2011-2015**



source: Author

**Appendix F: Three day event window results of the Abnormal Returns (AR) for the sample companies**

**Figure 4.81: AR during a three day event window for RDI for the period 2011-2015**



source: Author

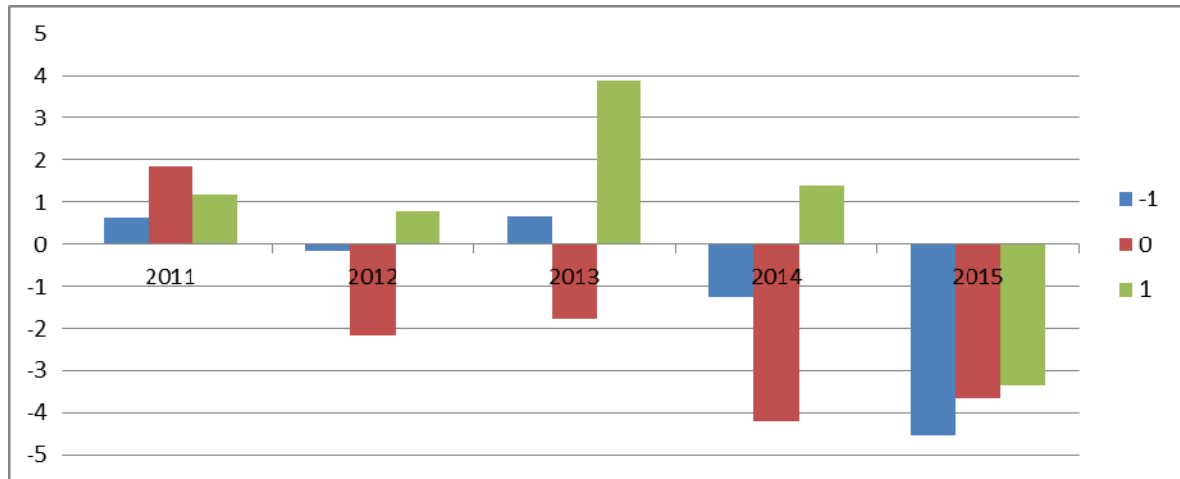
**Figure 4.82: AR during a three day event window for KEH for the period 2011-2015**



source: Author

## Appendix F: Three day event window results of the Abnormal Returns (AR) for the sample companies

Figure 4.83: AR during a three day event window for RBP for the period 2011-2015



source: *Author*

## Appendix G: Results of the AAR on the earnings announcement day

**Table 4.1: Average Abnormal Returns on the earnings announcement day**

Company code	Event day AAR (%)
ARI	-0.5558
AMS	2.5367
AGL	1.1356
ANG	-1.6109
ASR	0.2567
DRD	1.1651
GFI	-6.0546
HAR	-1.1034
IMP	-2.0073
LON	-0.2197
MRF	-0.3579
NHM	3.0240
TSX	-0.1433
PET	2.8582
SNU	-4.4856
RNG	4.8217
BAU	-0.2289
BDM	3.1509
BIL	-1.7534
EXX	0.0653
AQP	2.2616
WSL	3.6660
CMO	13.3454
PAN	1.2156
RDI	-0.0337
KEH	-0.9359
RBP	-1.9790

## Appendix G: Results of the AAR on the earnings announcement day

**Table 4.2: Descriptive statistics of AAR on the earnings announcement day**

Mean	0.667905033
Standard Error	0.673867563
Median	-0.033674841
Standard Deviation	3.50151857
Sample Variance	12.2606323
Kurtosis	6.049912063
Skewness	1.612349522
Range	19.39995604
Minimum	-6.054594015
Maximum	13.34536203
Sum	18.03343588
Count	27

**Appendix H: Results relating to the CAAR calculations during the event window period**

**Table 4.3: CAAR during the 51-day event window period**

<b>Company Code</b>	<b>CAAR (%)</b>
ARI	2.9317
AMS	18.5742
AGL	15.4139
ANG	6.6970
ASR	-2.0773
DRD	25.2000
GFI	0.3068
HAR	-1.1067
IMP	7.9822
LON	-17.5958
MRF	-1.8114
NHM	1.2025
TSX	12.1419
PET	-5.7348
SNU	-5.5248
RNG	13.7010
BAU	27.0705
BDM	-10.8396
BIL	-1.3516
EXX	5.5330
AQP	12.5581
WSL	-8.0606
CMO	17.3102
PAN	9.1023
RDI	22.4697
KEH	11.7474
RBP	12.4791

**Table 4.4: Descriptive statistics of CAAR on the 51-day event window period**

Mean	6.234047847
Standard Error	2.16503933
Median	6.696990983
Standard Deviation	11.24987436
Skewness	-0.04650645
Range	44.6663387
Minimum	-17.59579428
Maximum	27.07054442
Sum	168.3192919
Count	27



## Appendix I: Results relating to the hypothesis testing

**Table 4.6: Hypothesis testing t-stats**

<b>Company Code</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
<b>ARI</b>	5.6557	-4.5641	20.6117	-23.2597	14.6817
<b>AMS</b>	8.3901	-2.9735	12.8341	-10.8540	54.6817
<b>AGL</b>	-2.6590	-11.0265	27.9783	-24.8779	60.8132
<b>ANG</b>	-29.6223	-12.4276	28.4579	-12.8579	25.8455
<b>ASR</b>	-12.8524	6.9867	14.8178	-38.7253	9.9684
<b>DRD</b>	34.9391	6.4648	-0.7759	24.1645	23.2350
<b>GFI</b>	-21.7477	-28.6958	38.8583	-20.6320	9.3846
<b>HAR</b>	16.6534	2.4892	9.3061	-12.6536	-11.5259
<b>IMP</b>	9.3927	9.5131	23.9451	-9.4017	10.9834
<b>LON</b>	-4.8335	-43.6231	4.8874	9.7557	-29.8132
<b>MRF</b>	11.7116	-12.6714	-5.3175	-9.5424	6.9434
<b>NHM</b>	-3.7961	33.0629	8.0974	-8.6776	-18.5316
<b>TSX</b>	19.2787	8.1333	2.2635	-3.7267	11.2483
<b>PET</b>	-13.6462	-8.2352	8.8665	-18.3085	5.5718
<b>SNU</b>	-8.1357	-16.5580	-18.9708	6.2214	2.1219
<b>RNG</b>	-4.2279	4.7159	26.3143	-4.6241	5.1421
<b>BAU</b>	-0.9290	-3.0540	23.6767	0.2923	7.2573
<b>BDM</b>	-0.0669	-0.1159	-2.0450	-6.7664	-10.8045
<b>BIL</b>	-18.0743	11.7053	-2.5393	-24.4111	4.2996
<b>EXX</b>	6.6042	-1.4822	-15.2011	-9.8505	29.7203
<b>AQP</b>	-8.9967	8.4793	5.8530	-3.2886	44.3668
<b>WSL</b>	-0.9085	8.3540	0.3798	-27.7271	-11.9028
<b>CMO</b>	-7.7131	2.1509	-13.1732	13.8501	21.6163
<b>PAN</b>	-2.0127	6.0213	19.6323	-27.3770	47.8515
<b>RDI</b>	6.5685	-4.2137	35.5031	-7.0083	7.1612
<b>KEH</b>	3.7002	1.5304	29.3659	4.3002	-5.7965
<b>RBP</b>	4.4217	-8.0973	0.0087	0.5461	48.1363

## Appendix I: Results relating to the hypothesis testing

**Table 4.7: Hypothesis testing p-values**

<b>Company Code</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
<b>ARI</b>	0.0000	0.0000	0.0000	0.0000	0.0000
<b>AMS</b>	0.0000	0.0029	0.0000	0.0000	0.0000
<b>AGL</b>	0.0078	0.0000	0.0000	0.0000	0.0000
<b>ANG</b>	0.0000	0.0000	0.0000	0.0000	0.0000
<b>ASR</b>	0.0000	0.0000	0.0000	0.0000	0.0000
<b>DRD</b>	0.0000	0.0000	0.4378	0.0000	0.0000
<b>GFI</b>	0.0000	0.0000	0.0000	0.0000	0.0000
<b>HAR</b>	0.0000	0.0128	0.0000	0.0000	0.0000
<b>IMP</b>	0.0000	0.0000	0.0000	0.0000	0.0000
<b>LON</b>	0.0000	0.0000	0.0000	0.0000	0.0000
<b>MRF</b>	0.0000	0.0000	0.0000	0.0000	0.0000
<b>NHM</b>	0.0001	0.0000	0.0000	0.0000	0.0000
<b>TSX</b>	0.0000	0.0000	0.0236	0.0002	0.0000
<b>PET</b>	0.0000	0.0000	0.0000	0.0000	0.0000
<b>SNU</b>	0.0000	0.0000	0.0000	0.0000	0.0338
<b>RNG</b>	0.0000	0.0000	0.0000	0.0000	0.0000
<b>BAU</b>	0.3529	0.0023	0.0000	0.7700	0.0000
<b>BDM</b>	0.9467	0.9077	0.0409	0.0000	0.0000
<b>BIL</b>	0.0000	0.0000	0.0111	0.0000	0.0000
<b>EXX</b>	0.0000	0.1383	0.0000	0.0000	0.0000
<b>AQP</b>	0.0000	0.0000	0.0000	0.0010	0.0000
<b>WSL</b>	0.3636	0.0000	0.7041	0.0000	0.0000
<b>CMO</b>	0.0000	0.0315	0.0000	0.0000	0.0000
<b>PAN</b>	0.0441	0.0000	0.0000	0.0000	0.0000
<b>RDI</b>	0.0000	0.0000	0.0000	0.0000	0.0000
<b>KEH</b>	0.0002	0.1259	0.0000	0.0000	0.0000
<b>RBP</b>	0.0000	0.0000	0.9931	0.5850	0.0000

## Appendix J: Results relating to mean ARs and CAARs

**Table 4.8: Descriptive statistics for all selected companies in the sample**

Company Code	N	Minimum	Maximum	Mean	Skewness
ARI	51	-2.3183	2.3780	0.0575	0.0462
AMS	51	-2.0002	4.2836	0.3642	0.8461
AGL	51	-2.9333	3.3209	0.3022	0.0768
ANG	51	-2.2127	3.3730	0.1313	0.4542
ASR	51	-2.3560	2.7750	-0.0407	-0.0191
DRD	51	-2.3975	4.2810	0.4941	0.6676
GFI	51	-6.0546	3.3700	0.0060	-0.7660
HAR	51	-3.9341	3.7650	-0.0217	-0.1309
IMP	51	-2.1033	3.2249	0.1565	0.0943
LON	51	-16.7813	15.6478	-0.3450	0.1638
MRF	51	-3.5227	1.6351	-0.0355	-0.9402
NHM	51	-2.1075	3.0240	0.0236	0.2525
TSX	51	-2.4654	8.3894	0.2381	2.2255
PET	51	-2.6106	2.8582	-0.1124	0.2287
SNU	51	-4.6882	4.0827	-0.1083	-0.1542
RNG	51	-5.4424	13.8573	0.2686	1.7960
BAU	51	-7.5234	15.5138	0.5308	1.1115
BDM	51	-8.6643	5.4140	-0.2125	-0.5326
BIL	51	-1.7534	1.1736	-0.0265	-0.1628
EXX	51	-2.4640	3.4417	0.1085	0.8310
AQP	51	-3.8657	4.5293	0.2462	0.4001
WSL	51	-4.0415	3.7442	-0.1581	0.0181
CMO	51	-9.8637	23.1021	0.3394	1.6776
PAN	51	-2.2571	2.7299	0.1785	-0.1363
RDI	51	-6.0424	16.6742	0.4406	2.6390
KEH	51	-2.9748	4.3700	0.2303	0.4449
RBP	51	-2.3439	3.0797	0.2447	0.3400

## Appendix J: Results relating to mean ARs and CAARs

**Table 4.9: Mean ARs and CAARs around earnings announcements period**

Day (T)	AR	tAR	P-value	CAAR
-25	-0.2663	-4.0589	0.0000	-0.2663
-24	0.7050	10.7462	0.0000	0.4387
-23	0.7189	10.9575	0.0000	1.4239
-22	0.2870	4.3748	0.0000	1.0059
-21	-0.1472	-2.2445	0.0248	0.1398
-20	0.3044	4.6397	0.0000	0.1571
-19	0.4571	6.9671	0.0000	0.7615
-18	-0.0070	-0.1069	0.9149	0.4501
-17	0.1685	2.5685	0.0102	0.1615
-16	0.1224	1.8664	0.0620	0.2910
-15	0.0450	0.6853	0.4932	0.1674
-14	0.3278	4.9971	0.0000	0.3728
-13	0.6105	9.3055	0.0000	0.9383
-12	-0.1383	-2.1088	0.0350	0.4721
-11	-0.4937	-7.5249	0.0000	-0.6320
-10	0.2619	3.9915	0.0001	-0.2318
-9	0.3572	5.4453	0.0000	0.6191
-8	1.5665	23.8778	0.0000	1.9237
-7	0.9355	14.2589	0.0000	2.5020
-6	-0.1446	-2.2045	0.0275	0.7908
-5	-0.0092	-0.1396	0.8890	-0.1538
-4	-0.2083	-3.1755	0.0015	-0.2175
-3	-0.0098	-0.1489	0.8816	-0.2181
-2	1.3896	21.1808	0.0000	1.3798
-1	-0.6489	-9.8912	0.0000	0.7406
0	0.6679	10.1807	0.0000	0.0190
1	0.0082	0.1248	0.9007	0.6761
2	-0.2069	-3.1540	0.0016	-0.1987
3	0.1525	2.3251	0.0201	-0.0544
4	0.4473	6.8173	0.0000	0.5998
5	-0.0288	-0.4385	0.6610	0.4185
6	0.2431	3.7055	0.0002	0.2143
7	-0.6445	-9.8235	0.0000	-0.4014
8	-0.3841	-5.8541	0.0000	-1.0285
9	-0.4317	-6.5802	0.0000	-0.8158
10	0.0508	0.7742	0.4388	-0.3809
11	-0.3543	-5.4011	0.0000	-0.3035
12	0.8135	12.3997	0.0000	0.4591
13	0.3576	5.4502	0.0000	1.1710

Day (T)	AR	tAR	P-value	CAAR
14	-0.4922	-7.5030	0.0000	-0.1347
15	-0.0243	-0.3704	0.7111	-0.5165
16	-0.2959	-4.5100	0.0000	-0.3202
17	0.4837	7.3732	0.0000	0.1878
18	0.0546	0.8321	0.4053	0.5383
19	-0.4006	-6.1056	0.0000	-0.3460
20	0.4591	6.9987	0.0000	0.0586
21	-0.0709	-1.0802	0.2801	0.3883
22	-0.0790	-1.2041	0.2286	-0.1499
23	-0.3509	-5.3481	0.0000	-0.4299
24	0.0086	0.1306	0.8961	-0.3423
25	0.0673	1.0259	0.3050	0.0759

# EDITING AND **PROOFREADING** CERTIFICATE

7542 Galangal Street

Lotus Gardens Pretoria

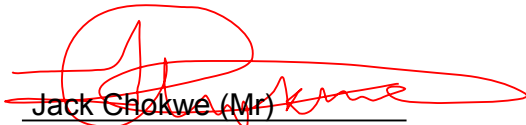
24 November 2016

## TO WHOM IT MAY CONCERN

This letter serves to confirm that I have edited and proofread Mr P. Maraisane's dissertation entitled: **"THE IMPACT OF EARNINGS ANNOUNCEMENTS ON SHARE PRICES OF MINING COMPANIES LISTED ON THE JOHANNESBURG STOCK EXCHANGE."**

I found the work easy and enjoyable to read. Much of my editing basically dealt with obstructionist technical aspects of language which could have otherwise compromised smooth reading as well as the sense of the information being conveyed. I hope that the work will be found to be of an acceptable standard. I am a member of Professional Editors Group and also a Language Editor at Bureau of Market Research at the University of South Africa.

Hereunder are my particulars:

  
Jack Chokwe (Mr)

Bureau of Market Research (Unisa)

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