



*Sculpting global leaders*

## Effects of macroeconomic news on the South African Financial Markets: A Domestic and Foreign Perspective

**Mauwane Kotane**

A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand in partial fulfilment of the requirements for the degree Masters of Management Finance and Investments

## **ABSTRACT**

There is plenty of research examining the relationship between surprise macroeconomic data and financial returns, however, in a South African context, such research is scarce. This paper adds to the event study body of knowledge by studying the effects of South African macroeconomic announcements on South African financial returns and juxtaposing that with the relationship of surprise macroeconomic announcements released in the United States with the same local financial instrument returns.

In this study, the review period is 10 years starting the beginning of 2006 and ending at the end of 2015. Two strands of economic news are studied, monetary news and real activity news against an equity futures index as a proxy for the South African Stock market; the R186 government bond as a proxy for the South African bond market and the spot US dollar to South African rand exchange rate. The monetary announcements studied are the interest rate adjustments of the South African and United States Central Banks and the consumer price index. The real activity data studied are the unemployment rate; the retail sales and the gross domestic product releases.

Many of the findings in this paper were in line with much of the literature where evidence shows that monetary policy has a significant effect on fixed income and forex rates. Stocks were also to be shown to be sensitive to both types of data.

The regression specification used in this study shows that local equities are more sensitive to both types of news, although mainly to South African news. Only monetary surprises are shown to be sensitive to the bond market and surprises from

both countries. Evidence is that the rand is only sensitive to the interest rate announcements released in the United States.

## **DECLARATION**

I, Mauwane Kotane, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilments of the requirements for the degree, Master of Management in Finance and Investments at the University of the Witwatersrand. It has not been submitted before for any degree or examination in this or any other institution.

---

Mauwane Kotane

Signed at Parktown

On the \_\_\_\_\_ day of \_\_\_\_\_ 2017.

## DEDICATION

This research report is dedicated to my late parents, Seocketso Isaac and Ntombi Catherine Kotane, who toiled their whole lives to enable me to get a good education. To my wife, who has endured with me throughout all the long hours and provided constant encouragement. To my family and friends who provided support.

## ACKNOWLEDGEMENTS

I wish to extend my sincere thanks to:

The Most High GOD for His everlasting love and protection

Professor Kalu Ojah for his patience and kindness

Meisie Moya and my fellow classmates for their constant advice

## Table of Contents

ABSTRACT .....	2
DECLARATION .....	3
DEDICATION .....	4
ACKNOWLEDGEMENTS .....	5
LIST OF TABLES .....	9
CHAPTER 1: INTRODUCTION .....	10
1.1 Introduction and context .....	10
1.2 Purpose of the Study.....	13
1.3 Data & Methodology.....	13
1.3.1 Standardised data .....	13
1.3.2 Futures market data.....	14
1.3.3 Bond Market Data .....	<b>Error! Bookmark not defined.</b>
1.3.4 Foreign Exchange .....	<b>Error! Bookmark not defined.</b>
1.3.5 Macroeconomic News .....	<b>Error! Bookmark not defined.</b>
1.3.6 Analysing the data.....	<b>Error! Bookmark not defined.</b>
1.4 Problem statement .....	14
1.5 Significance of the study.....	15
CHAPTER 2: LITERATURE REVIEW .....	15
2.1 Introduction.....	15
2.2 Efficient Market Hypothesis.....	18
2.3 A few studies on macroeconomic news effects .....	19
2.4 Event Study .....	28
2.5 Summary.....	29
2.5.1 Asset Classes .....	29
2.5.2 Geographic focus .....	30
2.5.3 Frequency of Data.....	30
2.5.4 Emerging market and South Africa.....	30
2.6 Summary.....	31
CHAPTER 3: METHODOLOGY .....	32
3.1. Introduction.....	32
3.2 Research Approach.....	32
3.3 Data .....	32
3.3.1 Futures Prices the effected return .....	32

3.3.2 Bond Market Data .....	34
3.3.3 Foreign Exchange Data.....	34
3.3.4 Macroeconomic announcements.....	34
3.4 Research Design .....	36
3.4.1 Variable Standardisation .....	36
3.4.2 Specification.....	36
3.5 Chapter Summary .....	37
CHAPTER 4: RESULTS .....	38
4.1. Introduction.....	38
4.2 Descriptive Statistics.....	38
4.2.1 South African Macroeconomic Data.....	38
4.2.2 United States Macroeconomic Data.....	39
4.3 Inferential Statistics .....	40
4.3.1 The Equity Futures market .....	40
4.3.1.1 South African Monetary data.....	40
4.3.1.2 South African Real Activity Data.....	41
4.3.1.3 United States Monetary Data .....	42
4.3.1.4 United States Real Activity Data.....	43
4.3.2 Fixed Income.....	43
4.3.2.1 South African Monetary Data .....	43
4.3.2.2 South African Real Activity Data.....	44
4.3.2.3 United States Monetary Data .....	44
4.3.2.3 United States Real Activity Data.....	45
4.3.3 Foreign Exchange Market.....	45
4.3.3.1 South African Monetary Data .....	45
4.3.3.2 South African Monetary Data .....	46
4.3.3.3 United States Monetary Data .....	46
4.3.3.4 United States Real Activity Data.....	47
4.4 Conclusion and Summary .....	47
4.4.1 South African data.....	47
4.4.2 United States Data .....	48
CHAPTER 5. FURTHER REMARKS AND CONCLUSION.....	48
5.1 Introduction.....	48
5.2 Research Findings.....	48
5.2.1 Equity Results .....	49
5.2.2 Fixed Income Results .....	50

5.2.3 Forex Results .....	50
5.2.4 Country Results .....	51
5.2.5 Real vs Monetary Results .....	51
5.3 Conclusions .....	52
5.4. Recommendations .....	53
5.4.1 Market Participants .....	53
5.4.2 Monetary Policy Makers .....	54
5.5. Suggestions for further study .....	54
References: .....	56



## LIST OF TABLES

Table 1 Macroeconomic data, date ranges and frequency .....	34
Table 2: Descriptive statistics for surprise SA macroeconomic news.....	38
Table 3 Decriptive statistics for surprise US macroeconomic news.....	39
Table 4: Effects of SA macro surprises on equity futures.....	40
Table 5: Effects of US macroeconomic surprises on equity futures.....	42
Table 6: Effects of SA macroeconomic surprises on fixed income .....	43
Table 7 Effect of US macroeconomic surprises on fixed income .....	44
Table 8: Effect of SA macroeconomic surprises on the SA rand.....	45
Table 9: Effect of US macroeconomic surprises on the SA rand .....	46
Table 10: Showing quantum of significant news from country.....	51
Table 11: Showing quantum of significant news by news type.....	51

# CHAPTER 1: INTRODUCTION

## 1.1 Research context

The literature regarding macroeconomic announcements effects on different assets classes is significant and dates back many years. Mackinlay (1997) claims that event studies have a long history. The studies are not only of interest to practitioners but also to policy makers. Ramchander, Simpson and Chaundhry (2005) state that the role of macroeconomic news on interest rates and yield spreads are of great interest to market observers and policy makers alike. The causality or bi-directional causality of markets will always be a topic of great interest to market participants and policy makers as significant amounts of wealth is generally at stake as practitioners and policy makers are accountable to the political institutions of the day, which in turn, are accountable to the people of a country in a democratic society. Rigobon and Sack (2001) state that the movements in the stock market can have a significant impact on the macroeconomy and are therefore likely to be an important factor in the determination of monetary policy.

Globalisation and technological advances have seen the economies of the world and the financial markets become increasingly integrated and to that end, levels of correlation between markets have increased in recent history. Other reasons for increased correlation and increased linkages between markets, as mentioned by Jefferis and Ockeahalam (1999) include:

- Increasing importance of international capital flows and mobility; resulting from the progressive removal of controls on capital by the major industrialised countries and some developing countries;

- the reduction of the degree of government intervention allows freely floating (market determined) prices and quantities to transmit excess demand pressures to other related markets (Ma 1993);
- Technological advances which have improved the speed of international financial transactions; improved the international flow of information between markets; helped to reduce transactions costs; and led to effective twenty-four-hour trading;
- Increases in the number of multinational companies whose shares are listed on more than one major international stock exchange; such companies also tend to be involved in economic activities in several different countries around the world and hence their performance will increasingly tend to be affected by global rather than country specific factors;
- Increasing international finance.

As a result of this globalisation and the correlations between markets, African market practitioners see it as necessary to be abreast of the economic landscape of the developed countries and not just in that of their domestic economy. Becker et al. (1995) state that heightened awareness of the US equity market performance is attributable to the dominance of the U.S. in the world marketplace. Because the U.S. is the dominant producer of goods and services in the world economy, the U.S. is also the most important producer of information.

Previous research documents a significant level of interdependence among international equity markets, with the U.S. market by far the most influential in the world (Becker et al. 1995). There is much research around the topic of the effects of macroeconomic news on financial markets, but this research is mainly dominated around the effects of linkages between developed economies. Both intra-country

domestic effects and cross country effects have been researched. For example, Hardouvelis (1988) looks at the response of exchange rates and interest rates to US macroeconomic news. He found that markets respond primarily to monetary news, but also to news about the trade deficit, domestic inflation and variables that reflect the state of the business cycle. Beechy and Wright (2009) estimated the reactions using high frequency data on nominal and index linked bond yields.

However, there is a dearth of research on the effects of macroeconomic news on African financial markets and other emerging markets, though Jefferis and Ockeahalam (1999) did examine linkages between SADC stock markets. They also looked at the linkages between those markets and developed countries and emerging markets in Latin America and Asia, but this study did not look at the effect of macroeconomic news, only the linkages using correlation for short term linkages and cointegration for long term linkages.

Being a market participant himself, the researcher has often seen markets react to macroeconomic news from abroad and to news locally, but such casual observation is not good enough and the industry needs a thorough analysis of whether price discovery on local financial markets are affected by domestic or foreign developed country macroeconomic news, more specifically the U.S. which, as mentioned earlier, is the biggest producer of goods, services and news.

There is a need to research the effects of both domestic and U.S. news on the South African financial markets empirically and to measure the effects of news on financial markets by looking at the statistical significance of the relationship between the daily returns of the three major asset classes, being equities, bonds and currencies and the surprise news announcements.

## **1.2 Purpose of the Study**

The purpose of the study is to analyse and evaluate the reaction of financial markets in South Africa to macroeconomic news from both the United States and domestically, and to determine whether South African financial markets react more to domestic news or foreign news from the USA. This analysis utilises high frequency price data to see if there are any reactions to the economic news at all. In essence, this paper answers these three questions:

- Do South African financial markets react to domestic macroeconomic news?
- Do South African financial markets react to US macroeconomic news?
- Which has a bigger effect on South African financial markets - domestic news or U.S news?

## **1.3 Data & Methodology**

In its semi-strong form, the efficient markets hypothesis is the simple statement that prices fully reflect publicly available information. Stocks prices change when traders buy and sell shares based on the views of future prospects for the stock. The future prospects for the stock are influenced by the unexpected news announcements (Jordan et al. 2012). According to the same authors, an efficient market reaction would be reflected by an instantaneous adjustment in price to fully reflect the new information; there is no tendency for subsequent increases or decreases to occur.

### **1.3.1 Standardised data**

A method this paper uses is the method used by Andersen, Bollerslev, Diebold and Vega (2007) which is to standardise the macroeconomic surprise to ensure the results are comparable. This method is explained fully in chapter 3.

### **1.3.2 Futures market data**

In the tradition of Andersen et al. (2007) and Becker et al. (1995), this paper uses futures market data as a proxy for stock market returns for several reasons.

- The South African TOP 40 futures contract is traded on SAFEX which begins trading at 8h30 and closes at 17h30 South African times, an hour more than the stock exchange.
- The S&P500 futures contract has overlapping time periods of trading with the SAFEX ALSI contract.
- The contract is the most liquid broad market instrument in the South African landscape other than the currency.
- There is a high correlation between the top40 spot index and SAFEX Alsi40 futures contract.
- The data is readily available from a variety of sources on a tick by tick basis, including Bloomberg, Reuters and SAFEX
- Numerous studies have found that the futures market leads the spot market in terms of price discovery (Andersen et al. 2007).

Daily closing prices for the equities are obtained from official exchange records, Bloomberg, Reuters and Inet Bridge.

### **1.4 Problem statement**

The last three decades of finance research have produced a tremendous number of papers examining the effect of news announcements on financial markets (Birz & Lott 2011). However, it is difficult to find literature on the effects of macroeconomic news on the South African markets. The lack of domestically focused research should hamper optimal decision-making by both market practitioners and regulators

and society in general, as there is no reference point for the interaction of news and assets prices. Given the above, a body of knowledge that is specific to macroeconomic news and financial market returns needs to be developed.

### **1.5 Significance of the study**

There is much literature on the effects of macroeconomic news of different asset classes like fixed income, equities and currencies but most of the work is on the effects on developed world financial markets. Also, most studies are domestically focused, as mentioned by Andersen et al. (2007). They found that Balduzzi et al. (2001) only studied the US bond markets reaction to US news. Others like Boyd et al. (2005) studied multiple asset classes, but only for the effects of one country, in this case, the US.

The author of this paper has not seen any such work that looks at the effects of macroeconomic news on South African asset classes and let alone the effects from both a domestic source and news from a foreign source. Hopefully the body of knowledge created from the paper could be used by practitioners in the performance of their work and by academics as a source of further research as this topic is explored further.

## **CHAPTER 2: LITERATURE REVIEW**

### **2.1 Introduction**

The study of the effect of macroeconomic announcements on the financial markets is essentially an event study. An event study measures a specific event on the value of a firm (MacKinlay 1997). At the same time, it can be said that an event study can also be a study of a specific event on not only the value of a firm as Mackinlay

(1997) states, but it can also be on the value or return of a market index or the value of a currency conditional upon that specific event.

The literature regarding macroeconomic announcements effects on different asset classes is large and dates back many years, indeed Mackinlay (1997) claims that events studies have a long history, with perhaps the first published paper being that of James Dolley (1993). In this section, the researcher does not make an attempt to cover it all, he rather aims to cover different aspects of literature that cover news for different asset classes, different geographies or different measurement periods for the data involved. This section gives the reader a broad perspective of the many angles that may and have been adopted in researching a topic of this nature.

The effect of economic news on asset prices has received increasing attention in economic literature because an outcome of the efficient markets/rational expectations hypothesis is that flexible asset prices change the moment new information about future fundamentals arrives in the market (Hardouvelis 1988). Hardouvelis (1998) mentioned the significant amount of literature available over two decades ago in 1988, and yet the research on the topic has continued to expand as the topic has gripped the interest of researchers.

The same sentiments as Hardouvelis (1998) were expressed by Birz and Lot (2011) 13 years later, when they said macroeconomic announcements effects on financial markets have been studied broadly in literature for many years. However, most of the research and papers have been related to the effects of macroeconomic announcement on European, Asian and American financial markets. Andersen et al. (2007) found that most of the research has been domestically focused, meaning that



researchers focus on the macroeconomic news and asset class responsiveness of the same economies.

A great interest of this paper is the South African markets and offshore news announcements juxtaposed against local macroeconomic news. The researcher has not found any research of this nature that focuses on South African financial markets. It is surprising that there are not many macroeconomic related event studies that cover the South African financial markets, since the South African financial landscape is considered highly sophisticated and by some measures, is the best in the world, for instance South Africa has the one of the highest Market Cap to GDP ratio in the world; South Africa has the 14th largest stock market in the world and there has also been an increase in event driven hedge funds, in the South African landscape. With the high level of sophistication in South African markets, one would expect market participants to be aware of the responsiveness of the local markets to both local news and also to US news as it is the largest economy in the world. Marshall, Musayev, Pinto and Tang (2012) point out that the impact of news of financial markets is important for trading and risk management purposes so it follows that a sophisticated market should have some data on its responsiveness to local and international news.

Market participants generally have certain expectations when it comes to scheduled macroeconomic announcements. These are usually the publicly available consensus figures of leading economists covering that particular economy. It is necessary to state that, in the context of macroeconomic announcements, this paper defines announcements, news and surprises as the unexpected part of an announcement which follows the tradition of many papers before this one. Variations to the consensus figures are what is referred to as the surprise element or the news.

Andersen, Bollerslev, Diebold and Vega (2003) defined news as the difference between expectations and realisations.

## **2.2 Efficient Market Hypothesis**

If a particular macroeconomic announcement is unexpected and it has an effect on the value of equity or foreign exchange markets, the prices of those markets should adjust instantaneously to reflect the unexpected information. This assertion is in line with the theory of the efficient markets hypothesis. The theory of efficient markets is concerned with whether prices at any point in time fully reflect available information (Fama 1970).

Efficient markets theory is a contentious issue both at practitioner level and also amongst researchers. Fama (1970) described three forms of efficient markets, the weak form, the semi-strong form and the strong form.

- A market is said to be weak form efficient if no alpha can be generated by study or use of information reflected in prices or volume figures of stock market data.
- A market is said to be semi-strong if no value can be gained by the attainment of publicly available information. In other words, fundamental analysis will not yield any superior returns in a semi-strong market. In a semi-strong market, the price of a security should quickly adjust to new information that becomes available and there should be no opportunity for further profit, by having the new information.
- A market is said to be of strong form efficiency if no excess return can be generated by having any sort of information regarding the company both public and private. Clearly this final assertion is very unrealistic, in that it

claims that even if one had inside information regarding future earnings no alpha could be achieved with this information.

It must be noted the forms of efficiency are subsumed in the order that they are presented above. That is, if a market is semi-strong efficient then, by definition, it is also weak-form efficient and a market that is of strong form efficiency is efficient in all other forms as well.

Securities price changes when traders buy and sell shares based on their views of future prospects for the stock. The future prospects for the stock are influenced by unexpected news announcements (Jordan, Miller & Dolvin 2012). In this light, news events should be instantly reflected by a change in prices for the affected asset class.

The pre-eminence of the efficient markets hypothesis has led to a number of studies on the effects of news on asset prices (Ito & Roley 1987). Many researchers have looked at different asset class and their determinants. Below we discuss some of their work.

### **2.3 A few studies on macroeconomic news effects**

Many empirical results studies have been undertaken to measure the effects of unexpected macroeconomic announcements on different asset classes. These studies have often been on the domestic effect, which is the effect of a particular country's economic announcements on that country's financial markets. However, there have also been studies of the effects of one country's economic announcements on the asset classes of another country.

Bernanke and Kuttner (2004) examined the effects of unexpected monetary policy actions on the US stock markets. They found that for broad market gauges like the

CRSP value weighted index, an unexpected 25-basis point rate cut would typically lead to an increase in stock prices in the order of one percent. They also found differences in responsiveness in the different industry sectors. To explain the economic reasons for the observed market response to policy surprises, Bernanke and Kuttner (2004) use a method which they adopted from Campbell (1991) and Campbell and Ammer (1993), which uses a vector autoregression (VAR) to calculate revisions in expectations of their key variables. In this paper, no attempt has been made to provide economic reasons to the responsiveness of the financial markets but the effects were simply measured and compared.

Beechy and Wright (2009) used high frequency data, that is the intraday price on nominal and indexed linked bond yields and forward rates to measure the effects of macroeconomic news announcements. They found that the nominal yields and forward rates are very sensitive to macroeconomic announcements. The announcements that Beechy and Wright (2009) concentrated on were 14 macroeconomic announcements, including the surprise element of FOMC decisions about the Federal Funds rate, the other announcements were the monthly capacity, confidence levels, Core CPI, Durable Goods, ECI, GDP, Claims, NAPM index, Nonfarm payrolls, New Home Sales, Core PPI, Retail Sales and the Unemployment figures. Beechy and Wright postulate that the use of high frequency data, 5-minute data in their case, isolates the announcement to being the only event that should be hitting the market at that time, thereby affording them the opportunity to accurately measure the effect of the news announcement without influence of other events.

Andersen, Bollerslev, Diebold and Vega (2003) looked at the effects on the conditional mean of the U.S dollar spot exchange rate caused by differences in macroeconomic expectations against actual realisations. They found that

announcement surprises produce conditional mean jumps and they conclude that high frequency exchange rate dynamics are linked to fundamentals. Interestingly, their paper also found the market reacts to news in an asymmetric fashion with bad news having a greater impact than good news.

The emerging market sovereign spreads and their determinants were looked at by Ozatay, Ozmen and Sahinbeyoglu (2009); they found that EMBI spreads respond substantially to US macroeconomic news and changes in the Federal Reserve's target interest rates. However, the magnitude and sign effect crucially depend on the state of the economy, such as the presence of inflation dominance.

Kim and Nguyen (2009) researched spillover effects of the US Fed and the European Central Bank's target interest rate news on the market returns and return volatilities of 12 stock markets in the Asia-Pacific area. Their findings were consistent with much of the literature in that the stock markets were responsive to news about the rates. This paper is similar in nature to that of Kim and Nguyen in that it also examines spillover effects from the US on the stock market returns and foreign exchange returns of a different country to the country in question, in this case, South Africa.

Pearce and Solakoglu (2007) studied more than one instrument though still a single asset class, in that they looked at the Dollar-Mark and Dollar-Yen over a 10-year period. These authors looked at the relationship of these two currencies and macroeconomic news and they further examined whether responsiveness of the foreign exchange markets are dependent on the state of the economy. Indeed, they find in their research that the responsiveness is dependent on the state of the economy and that the currencies are more significantly responsive at a higher

frequency of measurement. The period of measurement for Pearce and Solakoglu (2007) was the 10-year period from 1986 to 1996. Interestingly, the authors found that at a measurement of 5-minute frequency, the results were significant, but a response was not detected at a 6-hour interval.

Coleman and Karagedikli (2012) investigated the relative size of the effects of the macroeconomic news on multi-asset classes. The authors looked at the responsiveness of spot exchange rates and interest rate differentials (the 2 and 5-year swap rate differentials) and they also included in their research an investigation of the synthetic forward exchange rate schedule, for high frequency New Zealand data. Coleman and Karagedikli (2012) found that the spot exchange rate and the 5-year swap rates respond by a similar magnitude to monetary surprises. They also found that the spot rate responds nearly as much as the 5-year swap rates to CPI and GDP surprises. In their research, they also found that the exchange rates respond to current account news but the interest rates do not.

Contrary to Interest rate and exchange rate literature, Birz and Lott (2011) argue that there is not much in terms of literature that finds statistically significant stock price responses to real economic news. These authors take an interesting and unusual angle with regard to sourcing and defining news and announcements. While most researchers define news as the difference between expected announcements and actual announcements and their source is usually a market survey of economists, Birz and Lott (2011) choose newspaper articles as their source of news. The authors argue that newspaper releases reveal the meaning of the statistical release, accounting for different economic conditions and therefore can be an indicator of actual news associated with the release.

In line with previous research that compares real economic data and stock price responsiveness, Birz and Lott (2011) found that correlations between stock returns and retail sales, and durable goods were statistically insignificant; they posit that these variables are less important for investors' expectations of future economic conditions. However, the authors found a statically significant relationship between GDP and unemployment data and stock market returns.

Another interesting angle that was taken by previous researchers was the work of Marshall, Musayev, Pinto and Tang (2012); they looked at the effects of news announcements on the implied volatility of four foreign exchange markets. The macroeconomic announcements they were interested in were those made in the US and interestingly enough, they also included the Bank of Japan interventions. Unlike Andersen, Bollerslev, Diebold and Vega (2003), Marshall, Musayev, Pinto and Tang (2012) found no differences in the symmetry of negative or positive news when it came to their examination of the implied volatility. Marshall, Musayev, Pinto and Tang (2012) found that for US scheduled macroeconomic news announcement, the forex implied volatility tends to drop on the announcement day, but there are no significant changes in the forex implied volatility levels pre and post announcement.

A point made earlier regarding the South African markets is similarly echoed by Vithessonthi and Techarongrojwong (2012) when they state that although numerous studies have examined the effect of monetary policy on stock prices, empirical research in the international setting remains relatively scant. They look at the context of Thailand and investigate the impact of monetary policy decisions on stock returns. In contrast to many studies, they found no effect on stock returns as a result of unexpected changes in the repurchase rate at a market level. However, at a firm level, these authors did find an effect of the unexpected change in the repurchase

rate on stock returns. Like a few researchers before them, Vithessonthi and Techarongrojwong do note asymmetry in the stock markets response to changes in the repurchase rate.

Kim, McKenzie and Faff (2003) also looked at multiple asset classes in that they covered bonds, stocks and foreign exchange markets, but again like a few researchers before them, they only concentrated their efforts domestically in the US. Like many others before and after them, these authors find that the news effect of macroeconomic announcements causes a response from the financial markets, however in their analysis, they find that different macroeconomic announcements cause different reactions amongst the different asset classes. Stock markets showed responsiveness to inflation news. Unexpected trade data news was important for foreign exchange market responsiveness and the bond market was found to be affected by news regarding the internal economy. These authors looked at six of the news announcements which they considered most important, these are nominal foreign international trade balance; GDP; unemployment rate; retail sales growth; CPI and PPI.

Hess, Huang and Niessen (2008) examined the responsiveness of commodity prices to macroeconomic news. The authors looked at 17 macroeconomic announcements and found that the responsiveness of commodity prices is dependent on the state of the economy. In recessionary periods, commodity prices are responsive to unexpected changes in inflationary and real activity, but in expansionary periods, this responsiveness is not significant. Like the argument brought forward by Vithessonthi and Techarongrojwong (2012) and Andersen, Bollerslev, Diebold and Vega (2003), Hess, Huang and Niessen also found asymmetry of responsiveness in the asset class they were investigating.



Hardouvelis (1988) investigated the reactions to news of interest rates and exchange rates. Hardouvelis looked at 15 macroeconomic variables and found that his asset classes of interest responded mostly to monetary news, but also to news about the trade deficit and domestic inflation and variables that reflect the state of the business cycle.

The influence of macroeconomic news on term structure and quality spreads was examined by Ramchander, Simpson and Chaudhry (2005). These authors looked at 23 types of macroeconomic indicators. Of note is that they found that the fed's fund rate significantly influences every interest rate security in the system, but is itself shielded from movements of other interest rate securities. They found that unexpected changes in business activity drives the changes in the prime interest rate; Treasury yields and corporate yields are also found to be positively influenced by news that exacerbates inflationary expectations.

This paper takes a similar approach to that taken by Ito and Roley (1987) in that it looks at the influence of announcements from one country on the financial instruments of another. Ito and Roley looked at news from the US and Japan and compared their effects on the yen dollar exchange rates. These authors found the news from the US had a greater impact on the yen dollar exchange rate than did news from Japan. Their findings form an interesting base for comparison with the findings of this paper.

Do markets lead policy or does policy lead markets? An interesting paper at least with regard to making one think about the bidirectional causality of market responsiveness is that of Rigobon and Sack (2001). This paper looks at the reactions of the stock market that are explained by macroeconomic news, although

Rigobon and Sack (2001) look at the responsiveness of the Federal Reserve to movements in the market returns of the stock market. They find that a 5% rise (fall) in the S&P 500 increases the likelihood of a 25-basis point tightening (easing) by about 50%.

While theory suggests that news about overall economic conditions strongly affect stock prices, empirical evidence on the index level is mixed (Bestelmeyer & Hess, 2010). These authors looked at the reaction of the shares listed in the US to macroeconomic news surprises while considering its cyclicity i.e. its exposure of sales to the business cycle. These authors use individual shares as opposed to an index, they posit that the panel data approach is advantageous in that it provides necessary statistical power and second, that the firm specific approach allows them to uncover a strong influence on cyclicity. Third, they state that the cyclicity hypothesis strengthens previous evidence of a state dependent stock market response to real activity news.

Becker, Finnerty and Kopecky (1995) investigated the effects that US and UK macroeconomic news has on the government bond futures prices of the following countries, the United States, United Kingdom, Germany and Japan. They find that the US has significant effects on the futures prices of the Japanese, United Kingdom and German interest rates. They also found that the announcements from the United Kingdom had no effect on the foreign interest rates. These authors were one of the first to look at cross border effects.

Goeij and Marquering (2006) analysed the responsiveness of bond returns by looking at the securities' conditional volatility. These authors studied the daily returns of fixed income instruments of differing maturity and they also distinguished between

the different types of economic announcements and measured which type has greater responsiveness. They found that news regarding employment data and inflation are very significant for the long end of the yield curve and news announcements regarding monetary policy affects volatility significantly at the short end.

Sun and Sutcliffe (2002) examined the short-term interest rates responsiveness to the effects of surprise announcements of the UK Repo rate and the retail price index. The authors included both the spot, futures and options markets. They found that the surprises in the scheduled announcement of the data yielded reactions in the volatility of spot and futures interest rate markets and by definition, these volatility jumps also affect the options market. It should be noted that volatility is an input in the pricing of options.

Smith and Goodhart (1985) compared the reactions of the forex markets to announcements made in the United States and those made in the United Kingdom, in a similar vein to Ito and Roley (1987); Smith and Goodhart (1985) found that the US is more dominant in creating dollar-sterling reactions than were announcements from the United Kingdom.

The reaction of the Euro to global macroeconomic news was examined by Evans and Speight (2010); like many others before them (as cited in Smith and Goodhart, 1985), Ito and Roley (1987) found that the most significant announcements for EUR-USD were those from the United States. Evans and Speight (2010) used high frequency data, which has increasingly become popular in literature (see, for example, Beechy & Wright (2009); Andersen, Bollerslev, Diebold & Vega (2003). Evans and Speight (2010) state that the reaction of exchange rate returns to news is

very quick and occurs within the first five minutes of the release with very little reaction in the 15 minutes before and after. These findings show that exchange rates are strongly linked to fundamentals in the 5-minute intervals immediately following the data release.

Roache and Rossi (2010) examine the responsiveness of commodities to macroeconomic news by investigating the daily returns of 12 commodities futures contracts. These authors claim that in the period from 1997 and 2009, commodities were not as responsive to macroeconomic effects as other asset classes. Roache and Rossi adopted a different data set than Hess, Huang and Niessen (2008) in that the latter used broad indices as opposed to the formers' use of single instrument futures contracts. The two papers did however, have an overlapping period of examination.

## **2.4 Event Study**

Event Study methodology is one of the most frequently used analytical tools in financial research and the objective of an event study is to assess whether there are any abnormal or excess returns earned by security holders accompanying specific events (Peterson, 1989). It is clear from the amount of literature that event studies are extremely important and they can often provide an empirical underpinning to theoretical concepts and results can often guide policy makers in decision-making, an example of theoretical tests is market efficiency tests. Claims of whether a market is efficient or not can be tested using event study techniques. Brown and Warner (1980) posit that event studies provide a direct test of market efficiency. Khotari and Warner (2006) note that systematically non-zero abnormal security returns that persist after a particular type of corporate event are inconsistent with market efficiency. These authors point to the growing importance of event studies by

showing that in just five leading journals, there are over 500 published articles relating to event studies.

Brown and Warner (1980) state that event studies focus on the impact of particular types of firm specific events on the prices of affected securities. It should be clear that though much of event study research has focused on stock markets, the research can be conducted on any security or asset class which is traded. This paper focuses on stock market returns, fixed income returns and the foreign exchange market; the event is the different macroeconomic announcements.

## **2.5 Summary**

In this literature overview, the different event studies that have been performed over time were discussed. What is clear is that researchers have been interested in the empirical evidence that buttresses theory, such as whether a market is efficient or not.

### **2.5.1 Asset Classes**

Researchers have been examining the responsiveness of different types of financial instruments, ranging from foreign exchange instruments such as the work done by Andersen, Bollerslev, Diebold and Vega (2003), Pearce and Solakoglu (2007), Marshall, Masayev, Pinto and Tang (2012) while other researchers have focused on stock market instruments, such as Bernanke and Kuttner (2004), Birz and Lott (2011), Rigoban and Sacks (2001).

There have also been other researchers who have covered multiple asset classes such as Hardouvelis (1998), Kim, McKenzie and Faff (2003), Kim and Nguyen (2009)

### **2.5.2 Geographic focus**

Another notable difference in approach has been whether researchers have been internally focused or whether they have spread their research across borders. Ito and Roley (1987), Ozatay, Ozmen and Sahinbeyoglu (2009), and Kim and Nguyen (2009) were some of the authors who have looked for cross border effects. It is clear from the research that the macroeconomic news from the United States often causes responses from asset classes in other parts of the world; this is no surprise since the United States is the largest economy in the world and as such, the biggest trading partner of many economies.

### **2.5.3 Frequency of Data**

There has been a trend to use high frequency data in conducting an event study of macroeconomic news effects. Since there are many factors that might contribute to returns of financial assets in a particular period, the higher the frequency of the data the more a researcher is able to isolate specific events and measure their effect or responsiveness without the influence of many events.

### **2.5.4 Emerging market and South Africa**

It is indeed a pity that there is a dearth of macroeconomic event study research in the emerging market space. Vithessonthi and Techarongrojwong (2012) were one of first few to take an emerging market approach to the question of macroeconomic news on financial markets. The author of this paper struggled to find any research focused on South Africa, the prevailing event studies in the South African context are micro effects, such as dividend announcements or share splits. This paper adds to the body of knowledge in the local landscape and thus assists market participants and policy makers alike in decision-making.

## **2.6 Summary**

This Chapter began by discussing the literature regarding the theory of efficient market hypothesis, then it discussed various strands of research that have been undertaken to evaluate the effects that macroeconomic news has on various asset classes. The chapter discussed the strands under different headings showing differences in data chosen; differences in asset classes and differences in frequency of data.

## **CHAPTER 3: METHODOLOGY**

### **3.1. Introduction**

This chapter discusses the data; sources of data and model specification to be used in determining whether the surprise macroeconomic announcements influence the South African futures market. The research approach is discussed in section 3.3. Returns data is presented in section 3.4 under 3.4.1, and an explanation of the rationale for selecting the chosen returns data is given; and the source of the returns data is also provided in that section. Under section 3.4.2, the chosen macroeconomic variables are presented and explained. In section 3.5, titled Research design, the method, variable standardisation and the econometric specification are discussed under 3.5.1 and 3.5.2 respectively. The chapter is concluded in section 3.6.

### **3.2 Research Approach**

This study employs primarily quantitative methods for the research. Descriptive statistics are used to describe the macroeconomic data that are used in this study. An econometric model was used to infer a relationship between the macroeconomic announcements and the futures market returns.

### **3.3 Data**

#### **3.3.1 Futures Prices**

In determining the effect that US and RSA surprise macroeconomic announcements have on the South African equity market this paper followed the tradition of Andersen



et al. (2007) and Becker et al. (1995) in that it used SAFEX futures market data as a proxy for stock market returns for several reasons.

- The South African TOP 40 futures contract is traded on SAFEX which begins trading at 8h30 and closes at 17h30 South African times, an hour longer than the stock exchange;
- The S&P500 futures contract has overlapping time periods of trading with the SAFEX ALSI contract;
- The contract is the most liquid broad market instrument in the South African landscape other than the currency;
- There is a high correlation between the top40 spot index and SAFEX Alsi40 futures contract;
- The data is readily available from a variety of sources on a tick by tick basis, including Bloomberg, Reuters and SAFEX;
- Numerous studies have found that the futures market leads the spot market in terms of price discovery (Andersen et al. 2007).

Daily closing prices for the chosen market were obtained from January 2006 to December 2015 from official exchange records, and Bloomberg. Daily closing prices of the day an announcement is made and the day prior to the close were picked out from the 10 year closing prices data and used to calculate the returns. These returns were then regressed on the macroeconomic variables as is explained in more detail in section 3.5 below.

### 3.3.2 Bond Market Data

In the South African context, the R186 government bond is the most liquid and most capitalised bond. This bond is therefore used in the study for the analysis of the reaction of the South African Fixed Income market to foreign and domestic macroeconomic news announcements. Fixed income market participants consider this bond the benchmark bond and watch its movements closely.

### 3.3.3 Foreign Exchange Data

The South African rand spot exchange rate against the US dollar was used to examine the relationship between the local foreign exchange market and surprise macroeconomic news. The rand is a very liquid currency trading a daily average value of US\$51bn per the Bank of International Settlements.

### 3.3.4 Macroeconomic announcements

According to Bestelmeyer and Hess (2010), the literature regarding the relation between stock returns and macroeconomic factors can be divided into two strands according to the type of news being investigated. These are the monetary news strands and the real activity strand.

Since in this paper, the researcher was juxtaposing the US announcements and the South African announcements on the South African financial markets, he examined monthly or quarterly macroeconomic announcements that are common to both countries.

*Table 1 Macroeconomic data, date ranges and frequency*

Macroeconomic variable	Start Date	End Date	Frequency
Column (A)	(B)	(C)	(D)
RSA GDP	31-03-2006	31-12-2015	Quarterly
RSA Unemployment Rate	30-09-2012	31-12-2015	Quarterly
RSA Retail Sales	31-03-2008	31-12-2015	Monthly
RSA CPI	31-01-2006	31-12-2015	Monthly

<b>SA Repo Rate</b>	28-02-2006	30-11-2015	*Bi-Monthly
<b>USA GDP</b>	31-03-2006	31-12-2015	Quarterly
<b>USA Unemployment Rate</b>	31-01-2006	31-12-2015	Monthly
<b>USA Retail Sales</b>	<b>31-01-2006</b>	<b>31-12-2015</b>	<b>Monthly</b>
<b>USA CPI</b>	31-01-2006	31-12-2015	Monthly
<b>US Federal Funds Rate</b>	31-01-2006	31-12-2015	#8 weekly.

The Table above shows the macroeconomic data that were used in the study. Following the tradition of much of the literature, the following real activity data were studied; Gross Domestic Product, Unemployment rate and Retail Sales and the news regarding monetary announcements that were examined was the news regarding the Consumer Price Index; the SA repo rate and the US federal funds rate. The macroeconomic variable start and finish dates were chosen based on a 10-year period starting from 2006 to 2015. Survey estimates and actual release dates that are available on Bloomberg were used in the analysis. In instances where there were no estimates or surveys from market participants that months' data were not used in the analysis.

The frequency of the data is also shown in the table. The notable difference is the frequency of the interest rate announcements and unemployment rate of the two countries. Otherwise the frequency of the data is the same.

---

\*The South African Reserve Bank generally meets every two months to deliberate on the state of the economy and make an interest rate announcement to either keep rates the same or make an adjustment to the rates. In rare circumstances when the state of the economy justifies, the SARB will meet more often than that. #In the United States, the FOMC meets every 8 weeks but will also meet more often than that if the economic situation justifies it.

### 3.4 Research Design

#### 3.4.1 Variable Standardisation

The surprise component of the economic announcement is regarded as the difference between the actual announcement that was released and the expected announcement based on surveys of economists compiled by Bloomberg. Macroeconomic announcements have varying units of measurement and it is thus necessary to find a standard unit of measurement. It is common amongst researchers of event studies to standardise news announcements for measuring the surprise component of the announcement. This has been done by the likes of Balduzzi, Elton and Green (2001), Ozatay et al. (2009), Beber and Brandt (2010). The standardised surprise measure is obtained using the following formula.

$$S_{kt} = (A_{kt} - E_{kt}) / (\sigma_{\hat{k}}) \quad (\text{Eq. 2})$$

where  $A_{kt}$  denotes the announced value of indicator  $k$ ,  $E_{kt}$  refers to the markets expectation of indicator  $k$  as found in the Bloomberg survey and  $\sigma_{\hat{k}}$  is equal to the sample standard deviation of the surprise component  $A_{kt} - E_{kt}$ . Because  $\sigma_{\hat{k}}$  is constant for any indicator  $k$ , this standardisation affects neither the statistical significance of the estimated response coefficients nor the fit of the regressions compared to the results of the raw surprises (Andersen et al. 2007).

#### 3.4.2 Specification

In order to determine whether the macroeconomic announcements released in the US or RSA have an effect on market returns, similarly to Birz and Lot (2011), the following regression specification is used.

$$r_t = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_k X_k + \varepsilon_t \quad (\text{Eq. 1})$$

Where  $r_t$  is the return of a market variable at the close of the market on the day of the release of the macroeconomic economic surprises,  $X_1$  to  $X_k$  and  $\varepsilon_t$  is the error term.

Returns for futures, bonds and the currency are regressed on each macroeconomic variable individually in a simple regression model to test whether each of the economic surprises has explanatory power for the returns of the market.

Since this paper is measuring the macroeconomic variables for each country, the regression should give a level of indication as to which of the two countries' macroeconomic variables have a greater effect on the South African market.

The aim of the regression is to determine whether any of the macroeconomic surprise announcements as explanatory variables have any significant effect on the returns of the futures market returns and to measure that degree of association.

The significance of each macroeconomic announcement was compared on an individual basis and they were also compared collectively to determine country effect.

### **3.5 Chapter Summary**

This chapter detailed the macroeconomic data collected and used in this research study, the sources of that data were also explained. The chapter also presented the method necessary to standardise the data so that it may be used in the specification which was described in section 3.4

## CHAPTER 4: RESULTS

### 4.1. Introduction

This chapter details the results of the analyses from the methodology described in the previous chapter. Section 4.2 provides the descriptive statistics of the macroeconomic variables researched. Section 4.3 provides the inferential statistics with 4.3.1 discussing the findings of the research done to determine if there is a relationship between the South African equity futures market and macroeconomic releases. Section 4.3.2 discusses the findings of the research undertaken to find the relationship between the South African fixed income market and macroeconomic surprises. Section 4.3.3 caters for the South African rand and macroeconomic releases. Section 4.4 completes the chapter by providing a conclusion.

### 4.2 Descriptive Statistics

#### 4.2.1 South African Macroeconomic Data

*Table 2: Descriptive statistics for surprise SA macroeconomic news*

	<b>Unemployment Rate</b>	<b>GDP</b>	<b>Retail Sales</b>	<b>Repo Rate</b>	<b>CPI</b>
<b>Observations</b>	12	40	92	63	120
<b>Measure</b>	% Points	% Points	% Points	% Points	% Points
<b>Frequency</b>	Quarterly	Quarterly	Monthly	*Bi monthly	Monthly
<b>Release SA Time</b>	11H30	11H30	13H00	15H30	11H30
<b>Standard Deviation</b>	0.00881	0.00411	0.02109	0.00193	0.00398
<b>Max</b>	0.016	0.012	0.049	0.005	0.011
<b>Min</b>	-0.015	-0.011	-0.072	-0.005	-0.019
<b>Mean</b>	-0.002167	-0.000250	0.000609	0.000138	-0.000725

## 4.2.2 United States Macroeconomic Data

*Table 3 Descriptive statistics for surprise US macroeconomic news*

	<b>Unemployment Rate</b>	<b>GDP</b>	<b>Retail Sales</b>	<b>Fed Funds</b>	<b>CPI</b>
<b>Observations</b>	120	40	120	81	119
<b>Measure</b>	% Points	% Points	% Points	% Points	% Points
<b>Frequency</b>	Monthly	Quarterly	Monthly	8 Weekly	Monthly
<b>Release SA Time</b>	15h30	15H30	15h30	21h50	15h30
<b>Standard deviation</b>	0.00174	0.00671	0.00492	0.00041	0.00153
<b>Max</b>	0.004	0.017	0.018	0.0012	0.005
<b>Min</b>	-0.004	-0.017	-0.015	-0.0025	-0.004
<b>Mean</b>	-3.75E-04	-8.00E-04	-3.17E-04	-4.69E-05	2.13E-19

Table 2 and table 3 above show the descriptive statistics for the surprise economic announcements released in the South Africa and the United States respectively. The unemployment rate is released regularly in the United States, being monthly, compared to every quarter in the South African context. Most announcements released in the United States occur at 15h30 except the FOMC release of the fed funds rate which occurs at 21h30. During the US summer, the announcements happen an hour earlier as a result of daylight saving. All returns used in the regression were on the same days as the announcements except the release of the fed funds rate where the return of the financial instruments following the day of the announcements was used. The obvious reason is that the local markets are closed on the day the data point is released.

## 4.3 Inferential Statistics

### 4.3.1 The Equity Futures market

*Table 4: Effects of SA macro surprises on equity futures*

<b>Table 4</b>		Effect of SA macroeconomic surprises on equity futures			
	<b>Announcement</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
Panel A	<b>Monetary</b>				
	CPI	-0.234516	0.122363	-1.9165	0.0577
	<b>Repo</b>	<b>-0.475662</b>	<b>0.197696</b>	<b>-2.4060**</b>	<b>0.0192</b>
Panel B	<b>Real Activity</b>				
	<b>Unemployment</b>	<b>-0.730163</b>	<b>0.201816</b>	<b>-3.617**</b>	<b>0.0047</b>
	Retail	0.112338	0.157203	0.7146	0.4767
	GDP	-0.518820	0.299417	-1.732	0.0912

The table above shows the results of a regression in which the dependent variable is the daily closing return of the South African Top40 index. The bond return is regressed on surprises South African macroeconomic releases.

#### 4.3.1.1 South African Monetary data

The coefficient for the consumer price index is -0.23 implying a surprise 1 standard deviation increase in the announced CPI figure relative to market expectations decreases the return on the top40 futures index by 23 basis points. Since on standard deviation of the CPI surprises is 40 basis points, on average the futures index will decrease by 0.09%. The coefficient for the CPI surprise is not significant at the 5% confidence level.

The repo surprises are significant at the 5% significance level with the expected sign similar to the CPI sign. It is not surprising that a surprise increase in the repo rate will lead to decline of the equity futures index as Birz et al (2005) show the channel through which macro news could affect stock prices is through the discount rate



which would increase if the repo rate is increasing. For every 1 standard deviation increase in the surprise element of the repo rate, we could expect stock equity prices to decrease by 47 basis points.

#### **4.3.1.2 South African Real Activity Data**

Surprises changes in the unemployment rate also seem to have a statistically significant effect on the futures market returns at the 5% significance level. The sign is also expected as an increase in unemployment could be a telling sign that future cash flows to holders of stocks could have been overestimated. The magnitude of the coefficient seems to be the largest (-0.7) of the macroeconomic variables in the table. This could be because of the releases only occurring later so the release itself could be more anticipated by the market and thus a surprise causing a greater reaction. The standard deviation of the unemployment rate announcements is 88 basis points so, on average, the TOP40 futures index would decrease by 64 bps.

Retail sales and the GDP did not have statistically significant coefficients. The sign of the retail sales was expected, being positive, indicating that an unexpected increase in retail sales leads to an increase in the top40 futures return. The GDP sign was confounding being negative. The author expected that the sign would be positive.

**Table 5: Effects of US macroeconomic surprises on equity futures**

<b>Table 5</b> Effect of US macroeconomic surprises on equity futures					
	<b>Announcement</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
Panel A	<b>Monetary</b>				
	CPI	0.152104	0.127071	1.197	0.2337
	<b>Fed</b>	<b>-0.422480</b>	<b>0.179670</b>	<b>-2.351**</b>	<b>0.0212</b>
Panel B	<b>Real Activity</b>				
	Unemployment	-0.021593	0.143409	-0.1507	0.8806
	Retail	0.214826	0.129318	1.66122	0.0993
	GDP	-0.100495	0.247725	-0.40567	0.6874

The table above shows the results of a regression in which the dependant variable is the daily closing return of the South African Top40 index. The bond return is regressed on surprises United States macroeconomic releases.

#### 4.3.1.3 United States Monetary Data

Interestingly, the research indicates that the federal funds surprise announcements also show a coefficient that is significant at the 5% level. The two central Banks' major releases of interest rates seem to have a similar effect on the equity market. The coefficient of the fed funds rate is -0.42 showing similarity in both sign and magnitude to the coefficient of the repo rate announcements. Since the standard deviation of the federal funds rate is 0.04 basis points, on average, the futures market would decrease .016 basis points. Unlike South African CPI, the United States surprise CPI effects were not significant at any level on the returns of the futures market.

#### 4.3.1.4 United States Real Activity Data

The unemployment rate in the United States did not have a significant reaction on the futures market. Possibly a reason is that the unemployment rate in the United States is announced on the same day as the release of the non-farm payroll numbers and the market seems to have a greater preoccupation with that macroeconomic announcement than the unemployment rate. GDP has a negative sign although the coefficient was not significant at any level. Retail sales had no statistical effect.

#### 4.3.2 Fixed Income

*Table 6: Effects of SA macroeconomic surprises on fixed income*

<b>Table 6</b>	Effect of SA macroeconomic surprises on fixed income				
Panel A	<b>Announcement</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
	<b>Monetary</b>				
	<b>CPI</b>	<b>0.278623</b>	<b>0.084742</b>	<b>3.28789**</b>	<b>0.0013</b>
	<b>Repo</b>	<b>0.403745</b>	<b>0.129555</b>	<b>3.11638**</b>	<b>0.0028</b>
Panel B	<b>Real Activity</b>				
	Unemployment	0.128666	0.344969	0.37297	0.7169
	Retail	0.028088	0.090913	0.30895	0.7581
	GDP	0.175655	0.126765	1.38567	0.1739

The table above shows the results of a regression in which the dependent variable is the daily closing return of the R186 South African bond. The bond return is regressed on surprises South African macroeconomic releases.

##### 4.3.2.1 South African Monetary Data

South African monetary data surprises have a significant effect on the fixed income market. Both the CPI and the repo rate announcement have coefficients that are significant at the 5% confidence level. The positive signs of the coefficients are also as expected, a surprise increases in both the CPI and repo predict that bond yields will also increase. The standard deviation of the CPI and repo rate surprises are .004 and .0019 respectively. The coefficients show that a 1 standard deviation increase for CPI and Repo rates causes a 27 and 40 basis point increase in bond yields.

### 4.3.2.2 South African Real Activity Data

The real activity data did not have any coefficients that were significant including the GDP surprise coefficient which was not significant at any level. Real activity should not affect bond returns if a bond is investment grade because there is unlikely to be a default on that bond regardless of the level of activity in that economy and the cashflows to the bondholder are contractual and fixed. Interest rates however, affect the bond prices directly as the interest rate is used to discount the contractual cash flows.

**Table 7 Effect of US macroeconomic surprises on fixed income**

<b>Table 7</b> Effect of US macroeconomic surprises on fixed income					
	<b>Announcement</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
Panel A	<b>Monetary</b>				
	CPI	-0.098773	0.086467	-1.1423	0.2557
	<b>Fed</b>	<b>0.360050</b>	<b>0.131693</b>	<b>2.7340**</b>	<b>0.0077</b>
Panel B	<b>Real Activity</b>				
	Unemployment	0.036305	0.085700	0.4236	0.6726
<sup>1</sup>	Retail	<b>0.053105</b>	0.080634	0.6585	0.5114
	GDP	-0.075870	0.121493	-0.6244	0.5360

The table above shows the results of a regression in which the dependent variable is the daily closing return of the R186 year South African bond. The bond return is regressed on surprises United States macroeconomic releases.

### 4.3.2.3 United States Monetary Data

The coefficient for the surprise is not significant when the United States releases CPI figures. The federal funds rate surprise coefficient is significant at the 5% level. The repo rate coefficient has a positive sign and a level 0.36 meaning that a standard deviation rise in the fed funds rate results in 0.36-point increase in the yield of the

R186. The standard deviation of the fed funds announcement surprises is .00041. The t-statistic is 2.734 and the p value is 0.0077

#### 4.3.2.3 United States Real Activity Data

Panel B of the table above shows that the real activity data announcements made in the United States does not have predictability for local bond returns. Real economic activity in the United States would not affect the contractual cash flows of the South African government bond. There is little evidence of a transmission channel between the real activity in the United States and the R186.

#### 4.3.3 Foreign Exchange Market

*Table 8: Effect of SA macroeconomic surprises on the SA rand*

<b>Table 8</b> Effect of SA macroeconomic surprises on the SA rand					
Panel A	<b>Announcement</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
	<b>Monetary</b>				
	CPI	0.089037	0.123748	0.7194	0.4733
	Repo	-0.095978	0.136825	-0.7014	0.4857
Panel B	<b>Real Activity</b>				
	Unemployment	0.400033	0.269739	1.4830	0.1689
	Retail	-0.031262	0.225455	-0.1386	0.8900
	GDP	0.011219	0.192810	0.0581	0.9539

The table above shows the results of a regression in which the regressand is the daily closing return of the spot USDZAR. The rand return is regressed on surprises on South African macroeconomic releases.

#### 4.3.3.1 South African Monetary Data

Across the two examined strands of monetary data, there was no evidence of a predictable relationship between the surprise releases of the monetary data and the returns of the spot rate of the South African rand. The CPI surprise had a t-statistic of

0.71 and the repo rate had a value of 0.7 and the respective value for standard deviation was 0.004 and 0.0019. The sign of the coefficients for the CPI coefficient was unexpected. CPI had a positive sign and the repo rate had a negative sign, implying that a surprise increase in the level of the consumer price index leads to a weakening currency and in the case of the repo rate, a higher than expected increase in the rate leads to an appreciation of the currency.

#### 4.3.3.2 South African Monetary Data

Similarly, to the monetary announcements the real activity data did not show as having an influence on the returns of the local currency. The unemployment rate, retail sales and GDP all had coefficients that were not statistically different from zero with t-stats of 1.48; -0.139 and 0.0581 respectively. The three pieces of real activity data had standard deviations of .0088; .021 and .0004 respectively.

**Table 9: Effect of US macroeconomic surprises on the SA rand**

<b>Table 9</b> Effect of US macroeconomic surprises on the SA rand					
Panel A	<b>Announcement</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
	<b>Monetary</b>				
	CPI	-0.104938	0.090274	-1.1624	0.2474
	<b>Fed</b>	<b>0.243998</b>	<b>0.121807</b>	<b>2.0031**</b>	<b>0.0486</b>
Panel B	<b>Real Activity</b>				
	Unemployment	-0.108692	0.097999	-1.1091	0.2697
	Retail	-0.077882	0.164396	-0.4737	0.6366
	GDP	0.101329	0.190145	0.5329	0.5972

The table above shows the results of a regression in which the regressand is the daily closing return of the spot USDZAR. The rand return is regressed on surprises United States macroeconomic releases.

2

#### 4.3.3.3 United States Monetary Data

The variations in the return for the South African rand against the dollar are not explained by surprises in the US CPI data. The CPI coefficient was not significantly different from zero with a t-statistic of -1.162 and a p value of 0.247. However, the

<sup>22</sup> \*\* means significant at 5% level

federal funds rate did have predictability for the returns of the SA rand. The coefficient of the federal funds macroeconomic surprise was 0.24 with a t-statistic of 2 and a p-value of 0.0486 implying significance at the 5% level, this leads to interesting conclusions in the next chapter in 5.2.3

#### **4.3.3.4 United States Real Activity Data**

The real activity data released in the United States does not have a significant influence on the returns of the South African currency spot rate. None of the real activity macroeconomic announcement released in the United States had a coefficient which was statistically different from zero.

### **4.4 Conclusion and Summary**

#### **4.4.1 South African data**

Surprise South African macroeconomic data had a significant influence on the asset classes measured in this paper except the foreign exchange market. The equities market was affected by both monetary and real activity data. The variations in the fixed income market were only explained by monetary data and not by real activity data. Surprisingly variability in the foreign exchange market was not explained at all by any form of South African data whether monetary or real activity.

A possible reason that the local data might have so little bearing on the rand is that the rand is considered a proxy for all emerging currencies and global emerging market trends might affect it more than the local picture. The rand is also one of the most liquid currencies in the world and thus trades on global fundamentals, not purely on South African data.

#### **4.4.2 United States Data**

The United States macroeconomic landscape had a significant effect on the South African Equity when it came to both monetary and real activity data. The US influence on the fixed income and foreign exchange market was limited to monetary data in the form of the repo rate. No other forms of US macroeconomic data, both monetary and real activity data, had a significant effect on the R186 and the USDZAR.

## **CHAPTER 5. FURTHER REMARKS AND CONCLUSION**

### **5.1 Introduction**

This chapter discusses the overall conclusions of the research undertaken, provides recommendations for its use and suggests ideas for further research. In section 5.2, the findings of the study are discussed. In section 5.3, a conclusion is provided. Section 5.4 and 5.5 discuss the recommendations and suggestions for further study.

### **5.2 Research Findings**

This study undertook to determine whether there is a statistically significant relationship between surprise macroeconomic announcements that are released in the domestic economy and those that are released in the United States and their effect on the major South African financial markets. Finance theory suggests that there should be a relationship between market returns and economic announcements (Birz and Lott 2011); this paper found the evidence to be mixed.

The macroeconomic data were separated into real activity news and monetary news. The financial markets that were studied were the JSE TOP40 futures index as a proxy for the equities market; the most liquid South African government bond for the



fixed income market and the South African rand exchange rate against the US dollar (USDZAR) for the foreign exchange market.

The methodology chosen as a tool of study was a regression model where the various returns of either the equity futures, the bond yields or the currency returns were the regressand and regressed onto the surprise components of the various macroeconomic news.

### **5.2.1 Equity Results**

The evidence shows that it is the equity returns that were most affected by surprise macroeconomic announcements. From the 10 regressions that were run for equity returns, three of the macroeconomic indicators were shown to have a statistically significant relationship at the 5% significance level. These were the South African repo rate, the US federal funds rate, the South African Unemployment rate and the US retail sales figures. Two from five South African indicators and one from five US indicators therefore were shown to have statistical influence on the equity futures returns. Evidence showed that both real activity and monetary data surprises have a level of influence over the equity returns. These findings are in line with much of the literature, for example, Birz et al. (2011) find that both GDP and the unemployment rate affect stock prices. Vithessonthi and Techrongrojwong (2012) found that their evidence lends support to the notion that monetary policy announcement have a significant effect on stock prices. Kim and Nguyen (2009) found in their work, that stocks respond negatively to interest rate increases. This paper also found a negative coefficient in both the repo rate and the fed funds rate.

### **5.2.2 Fixed Income Results**

The fixed income results were shown to have significance at the 5% level when it came to both sets of South African monetary data surprises studied and only the federal funds indicator from the United States showed significance. Real activity data from both South Africa and the United States did not however predict the fixed income returns. This is not an altogether surprising result, since South African government bonds are investment grade; the only factors that should affect their price is their cash flows and the interest used to discount those cash flows. The cash flows are contractual so those are not dependant on the level of activity in the economy, the interest rate therefore becomes the only varying factor in the equation hence the results only show significance with the monetary data. Again, the findings of this paper were in line with much of the literature and supported a theoretical framework for bond prices. Ramchander, Simpson and Chaudhry (2005) found that the fed funds rate is an important driving variable in the interest system. Ozatay, Ozmen and Sahinbeyoglu (2009) found that EMBI spreads respond substantially to US macro news and changes in the fed funds rate.

### **5.2.3 Forex Results**

Our regression result showed that the South African rand returns did not have a statistically significant relationship with any surprise macroeconomic announcement released in South Africa. The rand however did have a statistically significant relationship at the 5% level with surprise announcements of the federal funds rate this was the only piece of macroeconomic data under investigation that had influence on the currency returns. The possible reason that the rand failed to show a relationship with any South African data is that the rand is commonly referred to as a commodity currency or an emerging market currency, thus its returns would be more

closely linked with the fortunes of global commodity fortunes and/or the basket of emerging market currencies. We found that a tightening of the fed funds rate leads to a depreciation of the rand which is, by implication, an appreciation of the dollar. The coefficient for USDZAR rate was found to be 0.24 implying that at 10 basis points tightening leads to 24 basis point depreciation of the currency. This paper had similar results to, Coleman and Karagedikli (2012) who found that interest rates and currencies appreciate with CPI and monetary tightening

## 5.2.4 Country Results

*Table 10: Showing quantum of significant news from country*

	South Africa	United States
<b>Equity</b>	2	1
<b>Fixed Income</b>	2	1
<b>Forex</b>	0	1
<b>Total</b>	<b>4</b>	<b>3</b>

*The table above shows the number of the regressions that evidenced a significant relationship between financial instrument and the macroeconomic news from a specific country. By way of example 2 South African macro indicators registered significant relationship between with equity returns and 1 US indicator.*

From the above table, of the macroeconomic indicators that were studied in this paper, more South African news has influence over South African financial instruments than news from the United States. It must be noted though that the South African rand is not influenced by any South African news.

## 5.2.5 Real vs Monetary Results

*Table 11: Showing quantum of significant news by news type*

	Monetary News	Real Activity News
--	---------------	--------------------

<b>Equity</b>	2	1
<b>Fixed Income</b>	3	0
<b>Forex</b>	1	0
<b>Total</b>	6	1

*The table above shows the number of the regressions that evidenced a significant relationship between financial instrument and the type of macroeconomic news irrespective of country he news is from. By way of example 2 monetary indicators registered significant relationship with equity returns and no real news showed a relationship with forex.*

The evidence shows that monetary news influences more financial instruments than real activity data. The bond market and currency market are not affected by real activity news while the equity market is affected by both types of news.

### **5.3 Conclusions**

Equity returns are a function of future cash flows and the interest rate used to discount those cash flows to the present. Since cash flows of equity are a function of revenues and expenses in a business, the cash flows for equity holders are dependent on the level of real activity in the economy and monetary activity in the economy. It is therefore not too surprising that this study showed a significant relationship with elements of both monetary and real activity data.

Since South African government bonds are investment grade, the only factors that should affect their price is the cash flows and the interest used to discount those cash flows. The cash flows are contractual so those are not dependant on the level of activity in the economy, the interest rate therefore becomes the only varying factor in the equation, hence the results obtained only show significance with the monetary data.

The currency moves on global fundamentals - this is a possible reason that no South African data had an effect the exchange rate movements. However, the United

States being the biggest economy in the world did have an effect on the South African currency returns.

The 3 questions posed in the opening chapter this paper

- Do South African financial markets react to domestic macroeconomic news?
- Do South African financial markets react to US macroeconomic news?
- Which has a bigger effect on South African financial markets - domestic news or U.S news?

The following answers are provided.

Yes, South African markets do react to domestic macroeconomic news.

Yes, South African markets do react to macroeconomic surprises from the United States

Of the news items studies in this paper South African markets react differently to news depending on the financial return and the type of macroeconomic news being studied.

## **5.4. Recommendations**

### **5.4.1 Market Participants**

Market participants would do well to be aware of the relationships that various surprise macroeconomic announcements from various countries have with the asset returns of instruments in their portfolios. Surprise announcements might offer a trader an opportunity for strategic allocation of the portfolio to take advantage of any opportunities that might exist this can only be executed in the framework of the efficient market hypothesis. Risk Managers should also be aware of the relationship

between surprise announcements and asset returns to enable them to establish risk management strategies to minimise losses to clients and financial institutions.

#### **5.4.2 Monetary Policy Makers**

Rigobon and Sack (2011) state that movements in the stock market can have a significant impact on the macroeconomy and are therefore likely to be an important factor in the determination of monetary policy. It is also clear from the evidence presented in this study that surprises in monetary announcements are determinative for movements in the markets. Policy makers would do well to ensure that they are constantly transparent with their direction for monetary policy with the aim of minimising surprises to the market. This will assist in achieving market stability and credible price discovery and minimise risk and negative spill-over effects that affect the broader economy negatively.

#### **5.5. Suggestions for further study**

Studies that examine the relationship between macroeconomic announcements are extensive and date back many years. Mackinlay (1997) states that such studies have a long history. Unfortunately, these studies are often done in a setting outside of South Africa. There is a dearth of literature regarding the relationship between surprise macroeconomic announcements and South African asset classes. The scope for an event studies in the South African context remains wide.

Future research opportunities to conduct studies with different macroeconomic announcements from differing countries exist. This is especially true as different countries fight for economic dominance on the global platform, such as China. It could be interesting to see the effect of surprise announcements from China on local asset classes.

There also exists an opportunity to undertake this study by varying the time frame for the returns. Many international studies such as those of Beechy and Wright (2009), Pearce and Solakoglu (2007), Ramchander, Simpson and Chaudhry (2005) use five minute returns data for their study.

Indeed, there is also an opportunity to broaden the scope of asset classes used as the explained variable. As the South African economy develops further, there will more asset classes and instruments that gain prominence and as they get increased liquidity.

Future studies can also investigate if the relationship between macroeconomic announcements and returns changes over time or under different states of the economy.

## References:

Andersen, T.G., Bollerslev, T., Diebold, F, X., & Vega, C. (2003). Micro Effects of Macro Announcements: Real-Time Price Discovery in Foreign Exchange, *The American Economic Review* 93, 38-62.

Andersen, T.G., Bollerslev, T., Diebold, F, X., & Vega, C. (2007). Real-Time Price Discovery in global stock, bond and foreign exchange markets, *Journal of International Economics Review* 73, 251-277.

Bernanke, B.S., and Kuttner K.N, (2004). What Explains the Stock Market's Reaction to Federal Reserve Policy? *Journal of Finance*, 60, 1221-1257.

Becker, K., Finnerty, J, E., & Friedman J. (1995). Economic news and Equity market linkages between the US and UK. *Journal of Banking & Finance*, 19, 1191 -1210.

Becker, K., Finnerty, J, E., & Kopecky, K, J. (1995). Domestic macroeconomic news and foreign interest rates, *Journal of International Money & Finance*, 14, 763 -783.

Beechy M, J., & Wright H, J. (2009). The high frequency impact of news on long term yields and forward rates: is it real? *Journal of Monetary Economics* 56, 535-544.

Bestelmeyer G., & Hess D. (2010). Stock Price Responses to Unemployment News: State Dependence and the Effect of Cyclicalilty

Birz, G., & Lott, J, R. (2011). The effects of macroeconomic news on stock returns: New evidence from newspaper coverage, *Journal of Banking and Finance*, 35, 2791-2800.



Brown S.J., & Warner J.B. (1980). Measuring Security Price Performance, *Journal of Financial Economics*, 8, 205 -258.

Coleman, A., & Karagedikli, O. (2012). The relative size of exchange rate and interest rate responses to news: An empirical investigation, *North American Journal of Economics and Finance*, 23, 1-19.

Fama, E. (1970). Efficient Capital Markets: A Review of Theory and Empirical Work, *The Journal of Finance*, 25, 383-417.

Goeij, P. & Marquering, W. (2006). Macroeconomic announcements and asymmetric volatility in bond returns, *Journal of Banking and Finance*, 30, 2659-2680.

Goodhart, A. E. C. & Smith, R. G. (1985). The Impact of News on financial markets in the United Kingdom, *Journal of Money, Credit and Banking*, 17, 508-511.

Hardouvelis, A. G. (1988). Economic News, Exchange Rates and Interest Rates, *Journal of International Money and Finance*, 7, 23-35.

Hess D., Huang H. & Niessen A. (2008). How do commodity futures respond to macroeconomic news? *Swiss Society for Financial Market Research*, 22, 127-146.

Ito, T., & Roley, V.V. (1987). News from the U.S. and Japan: Which Moves the Yen/Dollar Exchange Rate? \*, *Journal of Monetary Economics*, 19, 255-277.

Jefferis, K. R. & Okeahalam, C. C. (1999). International stock market linkages in Southern Africa, *SA Journal of Accounting Research*, 13, 27-51

Jordan, B. D., Miller, T.W. & Dolvin, S. D. (2012). *Fundamentals of Investments, Valuation and Management*, 6th Edition. New York: McGraw Hill.

Khotari, S.P., & Warner, J.B. (2006). Econometrics of Event Studies, *Handbook of Corporate Finance*, 1, 3-36.

Kim, S.J., McKenzie, M.D., & Faff, R.W. (2003). Macroeconomic News Announcements and the Role of Expectations: Evidence for US Bond, Stock and Foreign Exchange Markets, *Journal of Multinational Financial management*, 14-4, 217-32.

Kim, S. & Nguyen, D.Q.T. (2009). The Spillover Effects of Tet Interest Rate News from the U.S. Fed and the European Central Bank on the Asia Pacific stock markets, *The Journal of International Financial Markets, Institutions and Money*, 19, 415-431.

Mackinlay, C. (1997). Event Studies in Economics and Finance, *Journal of Economic Literature*, XXV, 13-39.

Marshall, A., Musayev, T., Pinto, H., & Tang L. (2012). Impact of news announcements on the foreign exchange implied volatility, *The Journal of International Financial Markets, Institutions and Money*, 22, 719-737.

Ozatay, F., Ozmen, E., & Sahinbeyoglu, G. (2009). Emerging markets sovereign spreads global financial conditions and US Macroeconomic news, *Economic Modelling*, 26, 526-531.

Pearce, D.K., & Solakoglu, M.N. (2007). Macroeconomic News and exchange Rates, *The Journal of International Financial Markets, Institutions and Money*, 17, 307-325.

Peterson, P.P. (1989). Event studies: A review of issues and methodology, *Quarterly Journal of Business and Economics* 28(3), 36-66.

Ramchander, S., Simpson, M.W. & Chaudhry M.K. (2005). The influence of macroeconomic news on term and quality spreads, *The Quarterly Review of Economics and Finance*, 45, 84-102.

Rigobon, R. & Sack, B. (2001). Measuring the Reaction of Monetary Policy to the Stock Market, Sloan School of Management.

Roache, S. K. & Rossi, M. (2010). The Effects of Economic News on Commodity Prices, *The Quarterly Review of Economics and Finance*, 50, 377-385.

Sun, P. & Sutcliffe, C. (2002). Scheduled announcements and volatility patterns: The effects of monetary policy announcements on Libor and Short Sterling Futures and Options, *The Journal of Futures Markets*, 23, 773-797.

Vithessonthi, C. & Techarongrojwong, Y. (2012). The impact of monetary policy decisions on stock returns: Evidence from Thailand, *The Journal of International Financial Markets, Institutions and Money*, 22, 487-507.

