
# The Impact of Monetary Policy Announcements and Political Events on the Exchange Rate: The Case of South Africa

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# The Impact of Monetary Policy Announcements and Political Events on the Exchange Rate: The Case of South Africa*

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**Abstract**

Since 2000 the South African rand has been among the most volatile emerging market currencies, occasionally experiencing sharp depreciations. These sharp fluctuations in the value of the currency cannot be adequately explained by models of flow-supply and flow-demand of currency or by movements in fundamental factors, yet few studies have employed an asset pricing approach to explain exchange rate variability in emerging markets. To remedy this gap, we use an event study methodology to measure the impact of monetary policy announcements and political events on the exchange value of the South African rand. Using daily exchange rate data over the period March 1, 2000 to December 31, 2014, we find that the rand is highly responsive to both monetary policy announcements and political events. A total of 28 out of 43 monetary policy announcements displayed significant cumulative abnormal returns, while four political events, most notably the Marikana massacre, had significant impact on the rand.

**Keywords:** Event study, Exchange rate volatility, Asset pricing, Monetary policy, South Africa.

**JEL Classification:** E52, E58, F31, G14

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# 1 Introduction

The South African rand is an important emerging market currency and by far the most significantly traded African currency[1]. Since 2000 the rand has been among the most volatile emerging market currencies, occasionally experiencing sharp depreciations. Several studies have examined the determinants of rand fluctuations (see e.g. Aron, Elbadawi and Kahn, 1997; MacDonald and Ricci, 2004; Frankel, 2007; Saayman, 2007; Faulkner and Makrelov, 2008; Farrell, 2001; Arezki, Dumitrescu, Freytag and Quintyn, 2014; Mpofu, 2016). These studies, however, are primarily focused on traditional theories of the exchange rate that explain exchange rate movements over the medium to long-term. These approaches rely either on flow-supply and demand of currencies or the movement in long-term fundamental determinants of the exchange rate. Few studies have employed an asset pricing approach to exchange rate fluctuations in emerging market economies. That public announcements have significant impacts on exchange rates is well documented. Cosset and De La Rianderie (1985)[2], for example, found that political risk news that might contain information about the investment climate of a country induced exchange rate movements.

By definition, a nominal exchange rate is the price of one currency in terms of another and since a currency is a type of an asset, the price can be treated as an asset price. As such, the price of an asset can change when the entire foreign exchange market alters its view of the value of the asset in much the same way as stock prices can change instantly with little to no trade taking place. The arrival of new information causes dealers to either mark-up or down currencies over short periods. Thus, we can use empirical tools usually applied to analyse asset prices to exchange rate determination. We adopt an asset price approach, essentially following researchers who argue that exchange rate movements cannot always be explained by flow demand and supply (see e.g. Flood and Taylor, 1996; MacDonald, 1999; Morana, 2009).

This study contributes to the literature on exchange rate determination by employing an event study methodology á la Campbell, Lo and MacKinlay (1997) to an emerging market economy. The advantage of an event study is that it is able to quantify systematically the abnormal or unexpected impact of a political or economic event on asset prices. Kothari and Warner (2004)

[1]See page 10 of: Bank of International Settlements (2013), "Triennial Central Bank Survey. Foreign Exchange Turnover in April 2013: preliminary global results" Monetary and Economic Department. Cited at http://www.bis.org/publ/rpfx13fx.pdf

[2]This follows the link to Fama (1970) where different forms of foreign exchange market efficiency have been examined.

argue that event studies focusing on announcement effects over a short-run period around an event provides evidence relevant for understanding corporate policy decisions especially on the wealth of the firms' claimholders on the stock market. They also argue that event studies focusing on long-term periods, that is longer event windows, are vital for testing market efficiency. In addition, Fatum and Hutchison (2003) argue that the use of an event study is appropriate because: first, events have an unusual distribution and second, events have the possibility of changing over longer periods. Therefore, standard time series methods are often inadequate for analysing the impact of events.

Naturally because developed economies have more sophisticated financial markets, the literature that assesses the impact of news (and market efficiency) and events on asset prices is overwhemingly focused on markets such as the United States, United Kingdom, Australia, Canada, and New Zealand.

However, emerging market economies are steadily rising in importance in both international trade and finance. This in part is reflected by not only increasingly sophisticated financial and foreign exchange markets but also by rising levels of volatility and exposure to external shocks.

South Africa is one such emerging economy, host to the largest stock exchange in Africa (the Johannesburg Stock Exchange) with over a trillion US dollars in market capitalization. With a freely floating currency that is significantly traded, significant exposure to external shocks and substantive political and economic activity in recent years, South Africa presents an ideal case to study the impact of monetary policy announcements and political events on exchange rates. The studies that focus on South Africa either address issues related to the stock market (see e.g. Meznar, Nigh and Kwok, 1998; Gladysek and Chipeta, 2012; Gupta and Reid, 2013) or if they address exchange rate determination they use alternate methodologies (Fedderke and Flamand, 2005; Farrell, Hassan and Viegi, 2012; Maveé, Perrelli and Schimmelpfennig, 2016).

In this study we first establish that the South African rand is in fact a highly volatile currency relative to its comparators. Against this backdrop we ask what, if any, impact do South Africa's monetary policy announcements have on the rand? Further, to what extent do recent political events impact the rand?

These questions take on additional significance in the context of South Africa's current economic and political condition. South Africa has recorded persistent current account deficits implying that it relies heavily on foreign direct and portfolio investments to finance this imbalance. As a result, political events that signal increases in political risk are likely to influence the decisions made by foreign investors. For instance, negative news about the

domestic economy might induce capital flight which could adversely affect economic growth. Barr and Kantor (2002) assert that political uncertainty and economic growth have always been negatively associated in South Africa.

The exchange rate is sensitive to economic, social, and political news. As such, we only use monetary policy announcements which do not coincide with the release of other economic news and announcements classified as unanticipated, as well as major political or socio-political events. This study uses three exchange rates namely: rand/US dollar (henceforth, R/$), rand/British pound sterling (henceforth, R/£), and rand/euro (henceforth, R/€). These currencies are used because they are among the top four most liquid currencies in the world[3]. Moreover, South Africa has significant trade relationships with the European Union and the United States (see table 4).

The key findings of the study are that 28 out of 43 unanticipated monetary policy announcements have significant cumulative abnormal returns (CAR). The exchange rates' reaction to monetary policy are mixed. Sometimes an increase in the policy rate results in the appreciation of the exchange rates whilst during other times, an increase in the policy rate results in the depreciation of the currency. The study also finds significant CAR for all three exchange rates following the Marikana event on 16 August 2012. The African National Congress (ANC) party's elective conferences in 2007 and 2012 only have significant CAR using the R/$. The national elections in 2009 only have significant CAR using the R/$ and R/£. These results suggest that the rand is not only influenced by demand and supply flows but also by news.

The paper is organised as follows: Section 2 presents a review of the literature. Section 3 describes the background of South African economy. Section 4 describes the variables and provides descriptive statistics. Section 5 discusses the event study methodology. Section 6 presents the results and section 7 concludes.

# 2 Literature Review

There are two strands of empirical literature related to the impact of news on exchange rates. The first strand models news as time series innovations in the relevant macroeconomic variables, while the second strand models news as the difference between the actual and expected values of macroeconomic announcements (Galati and Ho, 2003).

[3]See page 10 of: Bank of International Settlements (2013), "Triennial Central Bank Survey. Foreign Exchange Turnover in April 2013: preliminary global results" Monetary and Economic Department. Cited at http://www.bis.org/publ/rpfx13fx.pdf

The empirical literature on the impact of news on exchange rates is based on the notion that if foreign exchange markets are efficient, then all anticipated relevant information should be incorporated in current exchange rates. This literature follows the seminal work of Fama (1970) who discusses three distinct forms of market efficiency: First is the weak form efficient market hypothesis which states that the past series of exchange rates contains no information about the future spot exchange rates; second is the semi-strong form market hypothesis which states that exchange rates fully reflect all publicly available information; and third is the strong form market hypothesis which states that all information (both public and private) is reflected in the exchange rate.

As stated earlier, evidence suggests that announcements of changes in the business environment affect exchange rates. As such, in this study we essentially test the semi-strong market hypothesis. Although the rand is generally volatile, we are interested in whether or not the arrival of new information leads to further increases in rand volatility (i.e. significant abnormal and cumulative abnormal returns). If yes, it means that news significantly impacts rand movements. If no, it means that news does not meaningfully impact rand movements. In this paper we model news following Frenkel (1981) who finds that during the 1970s, unanticipated events were a major determinant of exchange rate movements. Frenkel's (1981) model calculates news as unexpected change in the interest rate differential using an autoregressive process. However, his results suggest only weak evidence for the role of news. A possible reason for the weak results he obtained was because he used monthly data which are unlikely to capture the period of surprise caused by the arrival of new information. For this reason, this study uses daily data. Section five shows the modified version of Frenkel's model employed by Stancık (2007) to capture the impact of news.

Our paper is closely related to studies in developed economies that find that political, monetary policy announcements, and/or macroeconomic events matter for exchange rate movements. Cosset and De La Rianderie (1985) analyse the impact of political risk on foreign exchange market using daily data and a narrow event window (a day before to the day after or to two days after the event). Their results show significant abnormal returns and that unfavourable events cause the foreign exchange market to react more dramatically than favourable events. They state that this means political risk affects a country's investment climate and causes its currency to fluctuate. Galati and Ho (2003) use daily exchange rate returns to examine the reaction of the euro/U.S. dollar exchange rate to news about the macroeconomic situation in the United States and the euro zone between January 1999 and December 2000. They find that macroeconomic surprises significantly influences the

euro/U.S dollar volatility, with the news from the United States having a greater impact. Fatum and Hutchison (2003) examine the extent to which central bank interventions influences the exchange rate. They find that sterilised foreign exchange intervention is effective in influencing the exchange rate using two, five, ten, and 15-day pre- and post event windows.

Zettelmeyer (2004) uses a two-day event window around the announcements of monetary policy and finds that a percentage point increase in the market interest rate appreciates the exchange rates of Australia, Canada, and New Zealand on average by 2-3 percent. Kearns and Manners (2006) use the same technique but with intraday data and find similar results of exchange rates appreciating for the United Kingdom, Australia, Canada, and New Zealand. They state that their results show that the surprise in monetary policy explains only 10-20 percent of the movement in the exchange rate. A result they state suggests that monetary policy only explains a small part of the observed exchange rate volatility[4]. Faust, Rogers, Wang and Wright (2007) find similar results to Kearns & Manners', that tightening by the Federal Open Market Committee (FOMC) leads to the appreciation of the US dollar. The market interest rate is used by these studies to focus on policy shocks rather than the policy actions[5]. Kearns and Manners (2006) assert that monetary policy decisions are widely anticipated by the market. As such, their impact should already be incorporated into interest rates and exchange rates. As a result, there is a need to use the surprise component of monetary policy announcement. Besides, Bernanke and Kuttner (2005) state that unexpected policy actions correct for endogeneity and simultaneity.

In the same way, our paper is also related to some studies in emerging markets. Adam, Koziński and Zieliński (2013) investigate the extent to which central banks influence the exchange rate with foreign exchange interventions within an inflation targeting system. Using daily data and a five-day event window, they find significant abnormal returns which led to Polish zloty appreciating on average against the euro by 0.6%. Their results also show that the implied volatility decreased during the same 5-day window. Thus their results suggest that the central bank can influence the exchange rate even when they do not explicitly target it. Wong, Ariff and Ahmad (2014) examine the response of exchange rate returns in the Asia-Pacific markets to the United States and domestic economic surprises. Their results show that regional macroeconomic shocks are important in affecting

[4]Exchange rate volatility is measured as the average absolute change in the exchange rate over ten-minute intervals.

[5]The equation for these studies looks as follows: $\Delta e_t = \alpha + \beta \Delta i_t^{mkt} + \varepsilon_t$ where $\Delta$ refers to change, $e_t$ is the log exchange rate, $\alpha$ is the constant, $\beta$ is the parameter, $i_t^{mkt}$ is the market interest rate, and $\varepsilon_t$ is the error term.

exchange rate returns. They also find that the U.S Federal Reserve policy rate announcements were the most significant event among the 107 macroeconomic announcements analysed.

Mishra, Moriyama and N'Diaye (2014) employ an event study approach to examine the impact of Fed Tapering announcements on asset prices (exchange rates, government bond yields, and stock prices) in emerging markets (EMs). Using dummy variable panel regressions[6] for 21 EMs with a focus on 17 news dates of Federal Open Market Committee (FOMC) meetings and release of minutes between 1 January 2013 and 22 January 2014, Mishra, Moriyama and N'Diaye (2014) find that the currencies in EMs depreciated following Ben Bernanke's (the Federal Reserve Chairman at the time) speech on 22 May 2013 when the first signal of tapering was announced. Their results also show that EMs currencies appreciated following the Fed's postponement of tapering on 18 September 2013, while exchange rates did not react to 18 December 2013 meeting when the Fed actually implemented the tapering. Rai and Suchanek (2014) also use dummy variable regressions, applying both individual-country and panel analysis for 19 EMs with a focus on four events (22 May, 19 June, 18 September, and 18 December 2013 FOMC meetings). At a country level, their results for exchange rates are similar to Mishra, Moriyama and N'Diaye (2014) for the 22 May 2013 announcement while for 18 December 2013, they find a small impact. However, Rai and Suchanek (2014) also examine the abnormal returns on asset prices[7]. These results showed significant cumulative abnormal returns for the exchange rates with larger magnitudes than those yielded by dummy variable regressions.

As for South Africa, the studies that have been done using the event study method, are either restricted to stock market reaction to announcements/events (see e.g. Meznar, Nigh and Kwok, 1998; Gladysek and Chipeta, 2012; Gupta and Reid, 2013) or the exchange rate using the second approach highlighted earlier (see e.g. Fedderke and Flamand, 2005; Farrell, Hassan and Viegi, 2012; Maveé, Perrelli and Schimmelpfennig, 2016)[8]. Fedderke and

[6]The regression examined is as follows: $\Delta e_t = \alpha + \beta D_i + \varepsilon_t$ where $\Delta e_t$ is the 2-day change in the exchange rate before and after the event for each currency, $\alpha$ is the constant, $\beta$ is the parameter, $D_i$ is the vector of dummy variables for each of the announcements, taking the value 1 for the event date and 0 on all other dates. $\varepsilon_t$ is the error term. Other specifications include the variable $X_t$ to control for macroeconomic fundamentals.

[7]See their table A-1 for the results on the impact of Fed tapering on the exchange rates.

[8]Fedderke and Flamand (2005) analyse the impact of macroeconomic surprises for the following variables: CPIX, PPI, Repo rate, GDP, money supply, and trade deficit/surplus on the R/$ exchange rate for the period June 2001 to June 2004. Farrell et al. (2012) analyse the impact of inflation surprises on the R/$ exchange rate for the period 1997 to 2010. Maveé, Perrelli and Schimmelpfennig (2016) examine the role played by local and international economic surprises (where surprises equal the difference between market ex-

Flamand (2005) find that South African news does not have significant impact while external news from the U.S has significant impacts on the daily R/$ exchange rate. Maveé, Perrelli and Schimmelpfennig (2016) find that rand volatility is mainly driven by commodity price volatility, global market volatility as well as domestic political uncertainty. They also find that economic news from the United States matter most compared to news from South Africa, Europe and China in explaining rand volatility.

Given the above explanations, this paper contributes to the literature on the determinants of exchange rate fluctuation in emerging markets in three ways. First, we use an event study methodology which differs from Zettelmeyer (2004), Fedderke and Flamand (2005), Farrell, Hassan and Viegi (2012), Wong, Ariff and Ahmad (2014), and Maveé, Perrelli and Schimmelpfennig (2016). Like these studies, we run regressions of whether a set of right-hand-side variables affect the exchange rate returns or the measure of exchange rate volatility used, but then following Campbell, Lo and MacKinlay (1997), we differ with these studies in that we then test whether or not the exchange rate returns we study observed abnormal returns. Second, the South African studies have only researched on the performance of the R/$ exchange rate. Our paper is distinct from theirs in that we use three set of currencies which are R/$, R/£, and R/€. The latter two currencies are yet to be researched on macroeconomic and political shocks given that the most trading partner of South Africa between 2000 and 2014 is the European Union. Third, our paper focuses on the period during which South Africa's fundamentals have declined relative to peers. The deterioration of South Africa's fundamentals makes the use of models which apply movements of fundamental factors to explain exchange rate volatility inadequate. In addition, our time period allows us to have more monetary policy announcements unlike Fedderke and Flamand (2005).

# 3 Background

South Africa provides a rich context for analysing the impact of events on asset prices. After nearly five decades of state sanctioned racial segregation, in 1994 South Africa became a multi-racial democracy faced with a multitude of sizeable problems due to the tragic legacy of its past. Arising out of this, a number of political and monetary policy developments have taken place. First, South Africa's politics initially relatively uncontentious as South

pectations and data prints, captured by Citi Bank's Economic surprise index), commodity price volatility, global market risk perceptions and local political uncertainty on the R/$ exchange rate for the period August 2009 to August 2015.

Africa's liberation struggle party, the African National Congress (ANC) obtained a sweeping and overwhelming mandate at the polls in 1994. However, over time the common theme across South Africa's politics has been increasing contestation both within the ANC and outside it. Second, there were major institutional and policy changes to South Africa's monetary policy and monetary operations (Du Plessis, 2002; Aron and Muellbauer, 2007; Ndikumana, 2008).

## 3.1 Political Events

South Africa's political events typically occur because of the interaction of institutional reforms arising out of the 1994 constitution and South Africa's chronic economic problems of high structural unemployment and extremely high levels of income inequality. For example, in 1995 the ANC government passed the Labour Relations Act (LRA) which allowed every worker the right to form and join a trade union, to participate in the activities and programmes of a trade union and most notably to strike. In 2012 unsatisfied, as many workers in South Africa tend to be with their wages compared to the high profits of the company, with lack of employment opportunities in the community, high levels of inequality, unsafe and poor working conditions and a general sense that the benefits of mining were not being transferred to the local community, workers at Lonmin, a platinum mine in the Marikana area went on strike. This strike was met with aggressive action on the part of the government resulting in 34 deaths and 78 injuries[9]. This event came as a result of conflict between South African Police Service, Lonmin security, and the leadership of the National Union of Mines (an ANC allied union whose membership dropped dramatically as a result of cosy relations with mining management) on one side against the strikers on the other. Moreover, this incident led to several additional strikes across South Africa.

Similarly, the last two ANC elective conferences are key events in the political development of South Africa involving consequential contestation. Given the dominance of the ANC in South Africa's electoral politics, the internal elections of the ANC were considered the more significant battles for power. In 2007 for example, Thabo Mbeki the president of South Africa decided to run for a third term as party president (a position with no term limits) prior to the 2009 election notwithstanding constitutionally imposed two-term limits on the presidency of the country thus creating the potential for a constitutional crisis. His rival Jacob Zuma, a former deputy president of

[9]This event, referred to as the Marikana massacre is considered to be the most violent since the Sharpeville massacre in 1960.

the country who was fired on the basis of alleged corruption, defeated Thabo Mbeki comprehensively. However, on 20 September 2008, the ANC recalled President Thabo Mbeki and removed him from his position nine months before the end of his second term. In the 2012 ANC elective amid growing dissatisfaction with the direction of the country, the embattled president of the ANC and president of the country, Jacob Zuma defeated his deputy Kgalema Motlanthe. Cyril Ramaphosa, a pro-business and prominent ANC party member was elected deputy president of the ANC.

### 3.2 Monetary Events

In the month of February, 2000, the South African Reserve Bank (SARB) adopted an inflation targeting (IT) monetary framework with the aim of achieving the central bank's primary objective of price stability in a credible and transparent way. With the exception of 2004-2005 when the inflation target was 3-5 percent, SARB's inflation target has been 3-6 percent[10]. Under IT, the monetary policy committee (MPC) decides on the appropriate monetary policy stance and communicates policy decisions on predetermined announcement dates. Announcement dates can change in response to extreme events but the SARB generally has a preference to minimize surprises. After every MPC meeting, a statement is issued by the Governor, explaining the monetary policy stance, that is, why SARB increased, decreased or made no change to the repurchase rate (repo rate). SARB does not explicitly target the exchange rate but does participate in the foreign exchange market from time to time to manage liquidity and build international reserves.

Announcements of the repo rate have implications for market interest rates and consequently for the exchange rate. As a result, it is quite likely that monetary policy announcements would have some impact on the short-term behaviour of the rand. Focusing on the IT period of South Africa's monetary history is also useful because it is more likely to yield events where the causality for monetary surprises runs from interest rates to exchange rates (Kearns and Manners, 2006).

## 4 Data

This paper uses daily data for South Africa from 1 March 2000 to 31 December 2014 obtained from the South African Reserve Bank (SARB), Datas-

[10]See the monetary policy statements by Mr.T.T. Mboweni on 6 April 2000 and 15 November 2001 cited at http://www.resbank.co.za/Publications/Statements/Pages/MonetaryPolicyStatements.aspx

tream, and Bloomberg. The variables used are nominal exchange rates, forward exchange rates, and interest rates. We use nominal spot exchange rates for R/$, R/£, and R/€ specified using the direct quotation method. Using this definition implies that an increase in the spot exchange rate is a depreciation and a decrease is an appreciation. The values obtained are Reuters closing spot rates provided at or around 16:00hours in London. This time of the day reflects the middle of the global day and the time of highest liquidity in the foreign exchange market. Given that the study focuses on the short-term behaviour of the exchange rate, we use one-week forward exchange rates. Figure 1 shows the evolution of South African spot exchange rates, and it shows that relative to the dollar, the pound, and the euro, the rand depreciated on average during the following periods: March 2000 – December 2001, April 2006 – October 2008 and June 2011 – December 2014. The rand appreciated against all currencies on average during the following periods: January 2002 – April 2006 (during which the R/$, R/£, and R/€ appreciated by 56 percent, 46 percent, and 42 percent respectively) and October 2008 – June 2011. The appreciation between 2002 – 2006 was due primarily to a commodity price boom, lower domestic inflation, higher economic growth and other global factors during that period.

The most notable changes in the exchange rate occurred between June 2001 and December 2001 during which the R/$, R/£, and R/€ depreciated by 67 percent, 48 percent, and 77 percent respectively. This was likely due to the Argentina crises in 2001– 2002 and the September 2001 terrorist attack in the United States. Another sharp depreciation occurred between September and October 2008 during which the rand depreciated by 43 percent, 29 percent, and 26 percent against the dollar, pound, and the euro respectively. This was due to the onset of the 2008/2009 global financial crises in the aftermath of the Lehman Brothers bankruptcy on 15 September 2008. These trends seem to suggest that the rand is responsive to events.

We use the daily three-month treasury bill interest rates for South Africa and the United States. For the United Kingdom and Europe, we use the three-month London Interbank Offer Rate (LIBOR) and Euro Interbank Offer Rate (EURIBOR) respectively. Table 5 shows the summary statistics of the data over the entire study period. The table shows that forward exchange rates varied more relative to spot exchange rates based on standard deviation measure of variability. Table 5 also shows that R/€ was the most volatile currency followed by R/$ and R/£ respectively. As for interest rates, table 5 shows that South African interest rates exhibited most volatility followed by the United Kingdom, United States, and Europe respectively. South Africa has the highest average interest rates of 7.93 followed by the United Kingdom, Europe, and United States of 3.27, 2.32, and 1.78 respectively.

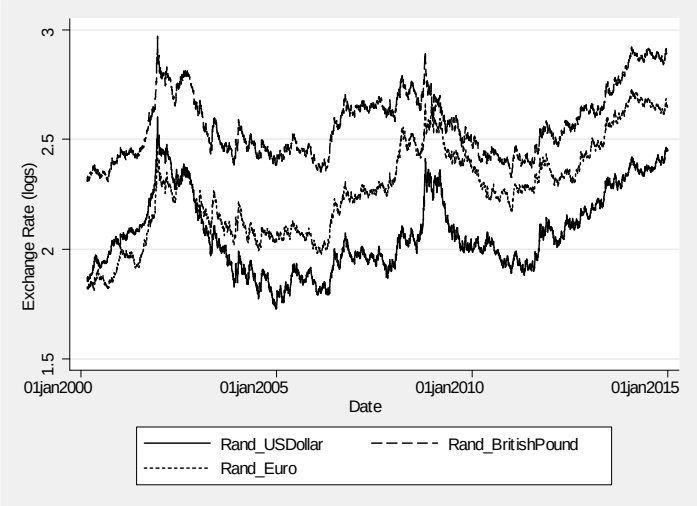


Figure 1: South African spot exchange rates, 1 March 2000-31 December 2014

We analyse two types of events, major political and socio-political events and monetary policy announcements in South Africa. The political events include the Marikana massacre, firing of 12000 striking workers by Anglo American Platinum, the African National Congress (ANC)'s elective conferences, the national elections in 2004, 2009, and 2014, and the recall of President Thabo Mbeki in 2008. Table 1 provides the description of these political events.

Between the inception of the inflation targeting system and 31 December 2014, South Africa's monetary policy committee (MPC) met 95 times. To examine the immediate response of the exchange rate to monetary policy announcements, the event study approach requires the use of unanticipated components of policy actions. As much as possible, we exclude all events that were easily anticipated[11]. During the sample period, we eliminated 35 such events on this basis leaving 60 events remain. Table 6 summarizes 60 events we consider during this period and table 7 documents the description of the events mentioned in table 6.

*[Insert table 6 and table 7 here]*

We then calculate the measure of surprise in monetary policy. Monetary policy surprise is constructed using the change in the three-month treasury

[11]This is based on the readings of the central bank statements after the MPC meetings and Bloomberg reports on South African economic activities.

Table 1: South African major political events

| Dates | Description |
|---|---|
| 16–20 Dec 2002 | ANC elective conference |
| 14-17 April 2004 | National elections |
| 16–20 Dec 2007 | ANC elective conference |
| 20 Sept 2008 | Recall of President Thabo Mbeki |
| 22-25 April 2009 | National elections |
| 16 Aug 2012 | Marikana Massacre |
| 5 Oct 2012 | Anglo American Platinum fires 12000 striking workers |
| 16–20 Dec 2012 | ANC elective conference |
| 7-10 May 2014 | National elections |

Notes: The Marikana massacre is when 34 striking mining workers were shot dead by the police. The ANC elective conferences usually take place every five years to choose individuals to leadership positions of the party.

Table 2: The Data

| | R/$ | R/£ | R/€ |
|---|---|---|---|
| Number of Events Used | 60 | 60 | 60 |
| Ratio of Event to Nonevent Day Exchange Rate Changes[a] | 1.33 | 1.10 | 1.16 |
| Average $\lvert\Delta e_{[t_0-t_{-1}]}\rvert$ | 0.90 | 0.85 | 0.79 |

Notes:[a]Exchange rate changes are calculated as the average absolute percentage change in the exchange rate on the day of monetary policy announcement and the day before. The sample of nonevent is constructed by taking the day exactly one week prior to monetary policy announcement day. Average $\lvert\Delta e_{[t_0-t_{-1}]}\rvert$ is the absolute percentage change in the exchange rate on the day of monetary policy announcement and the day before.

bill interest rate on the day after and the day of the MPC announcement of the official repo rate. This reduces the number of monetary policy events analysed to 43. Following Zettelmeyer (2004) and Gupta and Reid (2013), events are selected on the basis of the difference between the change in the repo rate and the change in the market interest rate. They argue that the market interest rate data can be used instead of the survey data because it is available at higher frequency and is of high quality.

Exchange rate changes are computed as the average absolute percent change in the exchange rate between the day of the announcement and the day before the announcement. Table 2 shows some preliminary evidence that monetary policy events have an impact on the exchange rate. But, how has rand volatility behaved over the study period.

Table 8 shows the rank ordered volatility of 19 emerging market (EM)

currencies over the study period. The table shows that the South African rand is among the most volatile currency among these EM currencies across several sample periods, before and after the 2008 global financial crisis.

*[Insert table 8 here]*

# 5 Event Study Methodology

Following Campbell, Lo and MacKinlay (1997) we employ an event study methodology. The goal of an event study is to measure the abnormal response of an asset price to an event (usually the arrival of news that may impact positively or negatively on the price). To do this we must compute a normal return.

The normal return is defined as the return that would be expected if the event did not take place. Campbell, Lo and MacKinlay (1997) state that there are two common methods of modeling the normal return. First is the constant mean return model and second, is the market model. This study uses the market model to estimate normal performance. The market model is written as follows:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \tag{1}$$

where $R_{it}$ is the period-t returns on security $i$, $\alpha_i$ and $\beta_i$ are parameters, $R_{mt}$ is the market portfolio, and $\varepsilon_{it}$ is a residual. Given that the exchange rate has similar characteristics as securities such as stock prices where stock returns is regressed on market return using equation 1 and the fact that the market model is a one factor model which in general can be extended to a multi-factor model, we use a simple market model which links exchange rate returns to news.

We use a simple market model because as Brown and Warner (1985) argue, simple risk-adjustment approaches perform well in conducting short-run event-window studies and are effective at detecting abnormal performance. Using simulations, Kwok and Brooks (1990) show that simple market models perform best when compared to mean-adjusted models, simple random walk models, and market-adjusted models (for example, capital asset pricing model (CAPM) and arbitrage pricing theory (APT)).

In this study we use a modified version of a model by Frenkel (1981). There are several advantages derived from using the Frenkel (1981) model as our baseline model. First, it has theoretical underpinnings based on the rational expectations hypothesis by Dornbusch (1979). That is, the model is a combination of efficient market hypothesis and uncovered interest rate

parity (UIP). Second, this model has higher explanatory power compared to other models. We conduct tests of the explanatory power of various versions of market models (see the appendix for the equations of other models[12]). Campbell, Lo and MacKinlay (1997) and MacKinlay (1997) argue that market models with high $R^2$ lead to more precise inferences. These studies assert that when using the market model, the higher the $R^2$ the greater is the variance reduction of the abnormal returns and the larger the gains from obtaining precise inferences. They also state that the gains in $R^2$ following additional factors is usually small in practice.

Assuming that asset markets clear fast and that the news is immediately reflected in changes in the interest rates together with Dornbusch's decomposition, Frenkel (1981) proposes a model for estimating the effect of news on exchange rate volatility as follows:

$$\ln S_t = \alpha_0 + \alpha_1 \ln F_{t-1} + \alpha_2[(i - i^*)_t - E_{t-1}(i - i^*)_t] + \omega_t \qquad (2)$$

where $S_t$ is the spot exchange rate, $F_{t-1}$ is the one period-lagged forward exchange rate, $\alpha_{0,1,and\ 2}$ are parameters, $i$ is the domestic interest rate, $i^*$ is the foreign interest rate, $E_{t-1}(i - i^*)_t$ is the interest differential expected at time t based on information at time $t - 1$, and $\omega_t$ is a random disturbance term. $E_{t-1}(i - i^*)_t$ is found by regressing the interest rate differential on a constant, two-lagged values of the interest rate differential and the natural logarithm of the one-lagged forward exchange rate. The first two components on the right-hand-side of equation 2 represent the expected exchange rate and the term in brackets represents news. Thus news is interpreted to be the unexpected change in the interest rate differential using an autoregressive process.

Frenkel (1981) estimates equation 2 using exchange rate in levels and uses monthly data. We differ from Frenkel (1981) by using daily data following Brown and Warner (1985) and Kothari and Warner (2004) who argue that using daily data leads to more precise pinpointing of an event. Because we find that our data is non stationary in levels, we estimate Frenkel's (1981) model in first difference of the variables as follows[13]:

$$\Delta \ln S_t = \beta_0 + \beta_1 \Delta \ln F_{t-1} + \beta_2[(i - i^*)_t - E_{t-1}(i - i^*)_t] + \epsilon_t \qquad (3)$$

[12]The other problem with some of these models is that we obtain zeros for the differenced interest rate differentials, thus reducing the number of observations. All nine models were estimated using 100 data points based on our defined estimation window.

[13]The model is estimated using ordinary least squares (OLS) with Newey-West robust standard errors.

where all variables are as previously defined and, $\beta_0, \beta_1,$ and $\beta_2$ are parameters, $\epsilon_t$ is a random disturbance term. An alternative specification employed uses $\Delta \ln S_{t-1}$ instead of $\Delta \ln F_{t-1}$ as follows:

$$\Delta \ln S_t = \beta_0 + \beta_1 \Delta \ln S_{t-1} + \beta_2[(i - i^*)_t - E_{t-1}(i - i^*)_t] + \epsilon_t \tag{4}$$

As discussed by Basdas and Oran (2014) different tests should be done for measuring normal returns and measuring abnormal returns. They argue that the choice of models is one of the most important aspects of event studies. This study uses 100 days prior to the event window as the estimation period. This follows studies like Campbell, Lo and MacKinlay (1997) who state that using daily data together with a market model requires that the parameters of the model are estimated over 120 days prior to the event. The average range of estimation periods (over several studies) using daily data is between 100 and 300 days inclusive (Basdas and Oran, 2014).

The abnormal return (AR) is defined as the actual ex post return of the asset price over the event window minus the normal return of the asset price over the event window. The abnormal returns are calculated as follows:

$$AR_{it} = \varepsilon_{it} = R_{it} - E[R_{it}|X_t] \tag{5}$$

where $\varepsilon_{it}$ is the abnormal return for a specific asset price $i$, $R_{it}$ is the actual return, $E[R_{it}]$ is the normal return and $X_t$ is the conditioning information for normal performance. The cumulative abnormal return (CAR) for exchange rate $i$ over the event windows is computed as follows:

$$CAR_{i,(T_1,T_2)} = \sum_{t=T_1}^{T_2} AR_{it} \tag{6}$$

where $T_1$ is the first day of the event window and $T_2$ is the last day of the event window. The event windows for each political and several monetary policy events are shown in table 3. We omitted one political event because it coincided with the release of the Net and Gross reserves numbers by the South African Reserve Bank. The testing procedure this study employs is a t-test which is calculated as follows:

$$t\text{-}test = (1/sqrt(number \text{ of days})) * (CAR/AR\_SD) \tag{7}$$

where number of days refers to the number of days in the event window, $AR\_SD$ is the abnormal return standard deviation. The purpose of the t-test is to check whether the average abnormal return for each exchange rate

is statistically different from zero[14]. In other words, it tests whether the occurence of an event significantly changed the exchange rate movements from its normal performance. Basdas and Oran (2014) show that a large number of studies use the t-test. Moreover, Kwok and Brooks (1990) argue that even though the assumption of normality may be violated when using parametric tests such as the t-test compared to non-parametric tests, the t-test is robust enough to detect the absence or presence of abnormal performance.

Table 3: Event Windows for Monetary Policy and Political events

| Event Name | Event Date ($t_0$) | Event Window |
|---|---|---|
| Monetary Policy Announcements | multiple dates* | ($t_0$,$t_{+1}$) |
| Marikana Massacre | 16 August 2012 | ($t_{-3}$,$t_{+1}$) |
| ANC elective conference | 18 December 2002 | ($t_{-2}$,$t_{+2}$) |
| ANC elective conference | 18 December 2007 | ($t_{-1}$,$t_{+2}$) |
| ANC elective conference | 18 December 2012 | ($t_{-1}$,$t_{+2}$) |
| Recall President Thabo Mbeki | 20 September 2008 | ($t_{-1}$,$t_{+1}$) |
| National elections | 17 April 2004 | ($t_{-1}$,$t_{+1}$) |
| National elections | 25 April 2009 | ($t_{-1}$,$t_{+1}$) |
| National elections | 10 May 2014 | ($t_{-1}$,$t_{+1}$) |

Notes:*see table 7 for details about dates of monetary policy announcements.

There are 43 surprise monetary policy announcements. Each monetary policy event has a 2-day event window, the day of announcement ($t_0$) and the day after ($t_{+1}$). We use short-term event windows to avoid conflating events.

# 6 Results

Tables 9, 10, 11, and 12 report the results of the event study. Tables 9 and 10 show the CAR results for political events and tables 11 and 12 show the CAR for monetary policy announcements. The CAR is shown on day zero, which is the day of the event. Two alternate specifications are estimated. Table 9 present the CAR results based on the model which uses equation 3 while table 10 present the CAR results based on the model which uses equation 4. The results show that there is very little between the two models. This is probably because of the high correlation between the one-lagged spot exchange rate and one-lagged one-week forward exchange rate. The correlation has a value of 0.9998, 0.9995, and 0.9960 for the R/$, R/£, and R/€ respectively.

[14]The null hypothesis for our analysis is that monetary policy announcements and political events had no effect on rand returns. That is, $H_0 : \varepsilon_{it} = 0$ or $\sum_{T_1}^{T_2} \varepsilon_{it} = 0$ where $\varepsilon_{it}$ is defined as in equation 5

*[Insert tables 9 and 10 here]*

The results show that there were significant and robust cumulative abnormal returns associated with the Marikana massacre. All three exchange rates have positive signs and are significant at the one percent level. The positive coefficient implies that the Marikana massacre, an event which left 34 mining workers dead, induced significant depreciation of the rand over and above what a typical flow supply and demand market model would imply. In terms of economic significance of the findings, a shock of one standard deviation as a result of the Marikana event caused the rand to significantly depreciate over and above its normal performance by 3.03 (3.03) percent, 3.06 (3.06) percent, and 3.05 (3.06) percent against the dollar, pound, and euro respectively as shown in tables 9 (and 10). To place the significance of this event in proper context, the Marikana massacre is considered the deadliest police action since the end of the apartheid era. It is not uncommon for labour markets to induce exchange rate depreciation. This arises due to the fact that labour unrests are considered to be political or sovereign risk. Depreciation is interpreted as negative, real or imagined, because a loss in the value of the currency signals the confidence investors have in the economic prospects of the country. South Africa relies heavily on foreign direct and portfolio investments to fund its current account deficit and spur economic growth. Such events have the potential to cause investors to reverse capital flows because of the expectation of further depreciation. This is in line with the arguments by Barr and Kantor (2002).

The ANC elective conference in 2007, had significant and robust abnormal results for the R/$. This event induced depreciation of the rand of 0.05 percent above its normal performance in both model specifications which was due to significant and controversial changes in the leadership of the ANC party. At the time, uncertainty abounded given the rivalry between Thabo Mbeki and Jacob Zuma, the two presidential contenders. Prior to this conference, Thabo Mbeki was the president for the country and the ANC, and was seeking a third term as ANC party president even though he was required to step down as country president at the end of his second term in 2009. Jacob Zuma's goal was to become party president in a bid to secure the presidency of South Africa in 2009. The election of the controversial Jacob Zuma to the party presidency in 2007 might have been viewed by investors negatively due to the uncertainty surrounding the policy and institutional direction the country would take under this new leadership. The results for 2002 ANC conference are insignificant for all the exchange rates.

The national elections in 2009, had significant and robust abnormal results for the R/$ and R/£. A shock of one standard deviation induced by the

results of these elections caused the R/$ and R/£ to significantly appreciate by 1.34 percent and 0.63 percent respectively for both models. These results mean that the markets were happy with what the national election results signaled. One explanation is that they signaled stability of the ruling party. This follows the recalling and removal of President Thabo Mbeki from office before the end of his second term in September 2008. Three days later, eleven cabinet Ministers and three deputy ministers resigned while some members left the ANC party and formed a new political party. The results for 2004 and 2014 national elections, and the recalling of Thabo Mbeki are insignificant for all the exchange rates.

The results also show that the CAR associated with the ANC elective conference in 2012, had significant and robust abnormal results for the R/$. This result shows that the R/$ appreciated by 1.98 percent significantly above its normal performance. The markets were generally happy with what the election result signaled. At the time Cyril Ramaphosa, widely considered to be pro-market and pro-business, was elected deputy president. The CAR results for the R/£ and R/€ rates were not significant. One possible explanation is due to the fact that liquidity in the R/$ market was at its lowest level in December. Any news therefore would likely have a much more significant impact on the R/$ rate.

In all instances, the size of the CAR coefficients are larger for unfavourable events. These results are similar to Cosset and De La Rianderie (1985). Our results also compare favourably to studies such as Eryiğit (2007) and Basdas and Oran (2014) that find significant impacts of political news on stock prices.

Tables 11 and 12 show the CAR results for monetary policy announcements based on the same two alternate specifications. Due to space limitations, we only present the results where at least one exchange rate recorded a significant cumulative abnormal return. The results show 28 out of 43 cases where at least one exchange rate has significant cumulative abnormal returns. In addition, there are 17 cases where at least two exchange rates had a significant abnormal effect and nine cases where all three exchange rates had significant CARs. Economic significance of the findings are that a shock of one standard deviation in the monetary policy surprise will cause the rand to significantly appreciate/depreciate over and above the normal performance in the range of 0.30-3.60 percent.

*[Insert tables 11 and 12 here]*

Following the monetary policy announcement on 13 June 2002 of 100 basis-points increase in the repurchase rate, all three exchange rates depreciated. Similarly, by contrast, all three exchange rates, appreciated following

a 50 basis-point increase in the repurchase rate on 12 October 2006. A 50 basis-point reduction in the repo rate on 9 September 2010 induced an appreciation relative to all three currencies considered here. At the same time, the results also show that all three exchange rates appreciated when there was no change in the repo rate on 9 December 2004, 10 February 2005, 22 November 2012 and 22 May 2014, whilst the results of no change in the repo rate on 8 December 2005 and 12 April 2007, led all three currencies to depreciate.

Our results contrast with other studies such as Zettelmeyer (2004) and Kearns and Manners (2006) that find that an increase in the monetary policy surprise (measured using the change in the market interest rate) results in an exchange rate appreciation. The mixed results we obtain might be due to the well documented empirical failure of uncovered interest rate parity condition (Engel, 1996). However, because our work cannot estimate the duration impact of monetary policy announcements, we cannot fully analyse whether the exchange rate we use upholds the UIP theory or not. Our results also compare favourably to studies like Wong, Ariff and Ahmad (2014) that find significant impacts of monetary policy announcements on exchange rates in countries like Australia, Indonesia, Malaysia, New Zealand, and Philippines.

Our results also show a different picture compared to other South African studies that use the daily exchange rate data. For example, our results indicate that South African news has a significant impact on the rand compared to Fedderke and Flamand (2005) who found that the daily R/$ did not move significantly in response to South African news. One possible explanation for these results might be differing expectations over inflation and economic growth by investors. Depending on the weight placed on inflation or economic growth, a monetary policy announcement resulting in an increase (decrease) in the policy rate might be interpreted as good news (bad news) or vice-versa. In support of this, Farrell, Hassan and Viegi (2012) find that since the adoption of inflation targeting system, the R/$ appreciates on impact due to bad news about inflation (i.e. inflation higher than expected) but depreciates due to good news.

# 7 Conclusion

Emerging markets are growing in importance both in international trade and finance as they become increasingly integrated into the global economy. Many of them have adopted free market reforms such as open capital markets and flexible exchange rates, that match their developed country counterparts but are still afflicted by issues that predominantly impact developing countries, issues such as 'dutch' disease and extreme vulnerability to commodity

price shocks and sudden stops. A consequence of this is a higher degree of exchange rate volatility. One such economy that exhibits these characteristics is South Africa. The South African rand is among the most volatile emerging market currencies on occasion experiencing very sharp depreciations.

Models that employ a flow-supply and flow-demand of currency approach or a long-run fundamentals approach to explain these sharp fluctuations do not adequately explain the volatility we observe. Notwithstanding this gap in the literature, few studies use an asset pricing approach to explain exchange rate variability in emerging markets.

In this study we contribute to the literature by applying an event study methodology to measure the impact of political and monetary news on the exchange rate using South Africa as a case. Since 2000 a number of events have shaped South Africa's macroeconomic landscape and created conditions that might be conducive to the degree of volatility the rand display.

Since 2000 South Africa's politics has become more competitive and more contentious as concerns rise over the future direction the country is likely to take, especially given the large residual problems arising over the country's tragic past. On monetary side, South Africa adopted a transparent inflation targeting approach to monetary policy.

We use daily exchange rate over the period 1 March 2000 to 31 December 2014 for the South African rand priced in three foreign currency units namely the US dollar, the pound sterling, and the euro.

Our finding show that both political and monetary events yield significant cumulative abnormal returns. Of 43 monetary policy announcements, 28 were significant. The way in which the exchange rate responded to announcement also provided evidence that events are important factors in exchange rate determination. For example, when an interest hike was announced, in some cases the rand appreciated as one might expect but in other cases the rand depreciated. This implies that the market is pricing the rand up or down on the basis of whether the news met, exceeded, or underperformed some benchmark or expectation, almost surely unrelated to flow-supply and demand of the rand.

Political events also had large and significant cumulative abnormal returns. Perhaps the most significant political event in South Africa's post-apartheid history, the Marikana massacre had a significant and adverse impact on South Africa in general and induced substantive depreciation of the rand. We also find that the 2007 and 2012 ANC elective conferences, and the 2009 national elections had significant exchange rate impacts.

Overall, many emerging markets have sophisticated financial and foreign exchange markets that exhibit high levels of volatility. We find that news matters, it is part of the story and partly explains short-run fluctuations in

the exchange rate.

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Appendix

Table 4: The country composition of South African exports and imports (2000-2014)

| Country | Percent of Exports to | Percent of Imports from |
|---|---|---|
| European Union | 29.40 | 35.23 |
| China | 12.33 | 10.47 |
| United States | 8.85 | 8.45 |
| Japan | 6.92 | 5.82 |
| India | 4.60 | 2.59 |
| Zambia | 1.83 | 0.32 |
| South Korea | 1.74 | 1.97 |
| Zimbabwe | 1.65 | 0.63 |
| Mozambique | 1.43 | 0.48 |
| Australia | 1.20 | 1.93 |
| Switzerland | 1.18 | 1.24 |
| Hong Kong | 0.86 | 0.57 |
| Canada | 0.80 | 1.12 |
| Thailand | 0.76 | 1.81 |
| Mauritius | 0.43 | 0.09 |
| Others | 26.02 | 27.27 |

Notes: The figures show the average percent of exports and imports between 2000 and 2014

Table 5: Summary statistics of the Data used

| | Log spot exchange rate | | | Log forward exchange rate | | | Interest rates | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | R/$ | R/£ | R/€ | R/$ | R/£ | R/€ | SATB91days | USTB91days | Libor3m | Euribor3m |
| Mean | 2.067 | 2.571 | 2.269 | 2.069 | 2.573 | 2.270 | 7.928 | 1.781 | 3.266 | 2.323 |
| Median | 2.033 | 2.551 | 2.272 | 2.035 | 2.552 | 2.274 | 7.320 | 1.100 | 4.008 | 2.138 |
| Maximum | 2.600 | 2.970 | 2.729 | 2.602 | 2.971 | 2.730 | 12.780 | 6.240 | 6.904 | 5.393 |
| Minimum | 1.726 | 2.306 | 1.808 | 1.728 | 2.307 | 1.809 | 4.900 | 0.000 | 0.504 | 0.078 |
| Std.Dev | 0.178 | 0.153 | 0.216 | 0.178 | 0.153 | 0.216 | 2.212 | 1.925 | 2.168 | 1.573 |
| Skewness | 0.539 | 0.480 | 0.061 | 0.538 | 0.478 | 0.059 | 0.420 | 0.826 | -0.137 | 0.212 |
| Kurtosis | 2.330 | 2.259 | 2.385 | 2.328 | 2.257 | 2.383 | 2.006 | 2.292 | 1.376 | 1.787 |
| Jacque-Bera | 259.801 | 237.151 | 63.354 | 259.360 | 236.816 | 63.602 | 272.858 | 521.032 | 437.350 | 266.444 |
| Probability | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Sum | 8003 | 9954 | 8785 | 8008 | 9958 | 8789 | 30688 | 6892 | 12641 | 8993 |
| Sum Sq.Dev | 122 | 90 | 180 | 122 | 90 | 180 | 18942 | 14343 | 18183 | 9576 |
| Observations | 3871 | 3871 | 3871 | 3871 | 3871 | 3871 | 3871 | 3871 | 3871 | 3871 |

Table 6: South African monetary policy events (1 March 2000-31 December 2014)

| Description | Monetary Announcements |
|---|---|
| Total Events | 95 |
| Number of Events used | 60[a] |
| Number of changes | 21 |
| Number of No-changes | 39 |
| Meetings per year[b] | 6 |

Notes: *a* MPC meetings on unscheduled dates are excluded. Changes by the MPC overshadowed by 11 September 2001 terrorist attacks in the USA; Zimbabwe problems, Argentina crises and fears of debt default in Brazil in 2002 are excluded. Events that coincide with or occur a day after the USA's Federal funds rate announcements, and Bernanke's signaling of Fed tapering on 23 May 2013 are excluded as well. South African events that occur on the same day as monetary policy announcements which are believed to influence market interest rate and exchange rate are also excluded e.g. releases of CPI/PPI, current account as % of GDP/Trade balance, Net or Gross reserves, money supply, and GDP. *b* the MPC usually meets six times per year. Exceptions include the year 2000(eight times), 2001(seven times), 2002(five times) and 2009(nine times). Meeting times are finalised before the beginning of each year.

Table 7: South African monetary policy actions, 2000 — 2014

| Date | Repo rate | Δ in policy rate | Date | Repo rate | Δ in policy rate |
|---|---|---|---|---|---|
| 6April2000 | | No | 13Apr2006 | | No |
| 19May2000 | | No | 8Jun2006 | 7.5% | Yes.↑by 50bps |
| 15June2000 | | No | 3Aug2006 | 8% | Yes.↑by 50bps |
| 11Aug2000 | | No | 12Oct2006 | 8.5% | Yes.↑by 50bps |
| 21Sept2000 | | No | 15Feb2007 | | No |
| 19Jan2001 | | No | 12Apr2007 | | No |
| 16Mar2001 | | No | 16Aug2007 | 10% | Yes.↑by 50bps |
| 14June2001 | 11% | Yes.↓by 100bps | 11Oct2007 | 10.5% | Yes.↑by 50bps |
| 26Jul2001 | | No | 10April2008 | 11.5% | Yes.↑by 50bps |
| 15Nov2001 | | No | 12June2008 | 12% | Yes.↑by 50bps. |
| 14Mar2002 | 11.5% | Yes.↑by 100bps | 14Aug2008 | | No |
| 13Jun2002 | 12.5% | Yes.↑by 100bps | 11Dec2008 | 11.5% | Yes.↓by 50bps |
| 28Nov2002 | | No | 22Oct2009 | | No |
| 20Mar2003 | | No | 13May2010 | | No |
| 12Jun2003 | 12% | Yes.↓by 150bps | 22Jul2010 | | No |
| 14Aug2003 | 11% | Yes.↓by 100bps | 9Sept2010 | 6% | Yes.↓by 50bps |
| 16Oct2003 | 8.5% | Yes.↓by 150bps | 18Nov2010 | 5.5% | Yes.↓by 50bps |
| 11Dec2003 | 8% | Yes.↓50bps | 20Jan2011 | | No |
| 22Apr2004 | | No | 24Mar2011 | | No |
| 10Jun2004 | | No | 21Jul2011 | | No |
| 12Aug2004 | 7.5% | Yes.↓50bps | 19Jan2012 | | No |
| 14Oct2004 | | No | 24May2012 | | No |
| 9Dec2004 | | No | 19Jul2012 | 5% | Yes.↓by 50bps |
| 10Feb2005 | | No | 20Sept2012 | | No |
| 14Apr2005 | 7% | Yes.↓50bps | 22Nov2012 | | No |
| 9Jun2005 | | No | 24Jan2013 | | No |
| 11Aug2005 | | No | 18Jul2013 | | No |
| 13Oct2005 | | No | 22May2014 | | No |
| 8Dec2005 | | No | 17Jul2014 | 5.75% | Yes.↑by 25bps |
| 2Feb2006 | | No | 20Nov2014 | | No |

Notes:Δ refers to change.↑ and ↓ refers to an increase and a reduction respectively. bps refers to basis points. Repo rate column shows the new repurchase rate after the change in policy rate.

Table 8: Rank Ordered Volatility of Selected Emerging Market Currencies- 1 March 2000 to 31 December 2014

| Currency | A | Currency | B | Currency | C |
|---|---|---|---|---|---|
| South African rand | 10.1% | South Africa rand | 11.2% | Hungarian forint | 9.5% |
| Hungarian forint | 8.9% | Turkish lira | 10.2% | Polish zloty | 9.0% |
| Brazilian real | 8.8% | Brazilian real | 9.8% | South Africa rand | 8.9% |
| Turkish lira | 8.4% | Hungarian forint | 8.3% | Brazilian real | 7.7% |
| Polish zloty | 8.2% | Czech koruna | 7.5% | Czech koruna | 7.3% |
| Czech koruna | 7.4% | Polish zloty | 7.4% | Russian rouble | 6.5% |
| Chilean peso | 6.1% | Chilean peso | 6.4% | Turkish lira | 6.4% |
| Mexican peso | 5.8% | Indonesian rupiah | 6.2% | Mexican peso | 6.3% |
| Colombian peso | 5.6% | Colombian peso | 5.6% | Korean won | 5.9% |
| Korean won | 5.2% | Mexican peso | 5.3% | Chilean peso | 5.7% |
| Indonesian rupiah | 4.7% | Korean won | 4.6% | Colombian peso | 5.6% |
| Russian rouble | 4.2% | Philippine peso | 3.7% | Indian rupee | 4.3% |
| Philippine peso | 3.4% | Thai baht | 3.5% | Malaysian ringgit | 3.6% |
| Indian rupee | 3.2% | Taiwan dollar | 2.4% | Indonesian rupiah | 3.1% |
| Thai baht | 2.9% | Peruvian new sol | 2.3% | Philippine peso | 3.1% |
| Malaysian ringgit | 2.3% | Indian rupee | 2.2% | Thai baht | 2.3% |
| Peruvian new sol | 2.2% | Russian rouble | 2.0% | Peruvian new sol | 2.1% |
| Taiwan dollar | 2.2% | Malaysian ringgit | 1.0% | Taiwan dollar | 1.9% |
| Chinese yuan | 0.5% | Chinese yuan | 0.4% | Chinese yuan | 0.7% |
| Median | 5.2% | Median | 5.3% | Median | 5.7% |
| Mean | 5.3% | Mean | 5.3% | Mean | 5.3% |

Notes: A is entire sample period. B is 1 March 2000 - 15 September 2008 and C is 16 September 2008 to 31 December 2014. Exchange rates are domestic nominal exchange rate per US dollar. Volatility is measured as the absolute percentage changes. These currencies are chosen based on liquid exchange rates classification by the Bank of International Settlements Triennial Central Bank Survey 2013.

Table 9: Impact of political events on South African rand

| | | CAR on Day 0 | | |
|---|---|---|---|---|
| Event Date | Event Name | R/$ | R/£ | R/€ |
| 16 Aug 2012 | Marikana Massacre | 0.0303*** | 0.0306*** | 0.0305*** |
| | | (2.5529) | (3.5534) | (2.8075) |
| 18 Dec 2002 | ANC elective conference | -0.0071 | -0.0056 | -0.0093 |
| | | (0.5581) | (0.6857) | (0.6152) |
| 18 Dec 2007 | ANC elective conference | 0.0005* | 0.0019 | 0.0022 |
| | | (1.7518) | (0.8376) | (1.4251) |
| 20 Sept 2008 | Recall President Thabo Mbeki | -0.0324 | -0.025 | -0.0302 |
| | | (-0.8597) | (-0.6036) | (-0.2551) |
| 18 Dec 2012 | ANC elective conference | -0.0199* | -0.0119 | -0.0098 |
| | | (-1.8145) | (-1.3865) | (-1.1803) |
| 17 April 2004 | National elections | -0.0274 | -0.0152 | -0.0193 |
| | | (-0.3450) | (0.0072) | (-0.2174) |
| 25 April 2009 | National elections | -0.0134*** | -0.0063*** | 0.0022 |
| | | (-5.8959) | (-4.0055) | (-0.8559) |
| 10 May 2014 | National elections | 0.0042 | -0.0024 | -0.0035 |
| | | (0.8619) | (-0.7874) | (-1.6143) |

Notes: These results use equation 3 for the estimated model. The number in brackets represents the t-test. The critical values are 2.576, 1.960, and 1.645 for 1%, 5%, and 10% respectively. ***, **, * represents significance at 1%, 5%, and 10% respectively.

Table 10: Impact of political events on South African rand (2)

| | | CAR on Day 0 | | |
|---|---|---|---|---|
| Event Date | Event Name | R/$ | R/£ | R/€ |
| 16 Aug 2012 | Marikana Massacre | 0.0303*** | 0.0306*** | 0.0306*** |
| | | (2.5588) | (3.5690) | (2.8190) |
| 18 Dec 2002 | ANC elective conference | -0.0071 | -0.0056 | -0.0093 |
| | | (0.6031) | (0.6912) | (0.5667) |
| 18 Dec 2007 | ANC elective conference | 0.0005* | 0.0019 | 0.0022 |
| | | (1.7520) | (0.8366) | (1.4261) |
| 20 Sept 2008 | Recall President Thabo Mbeki | -0.0324 | -0.025 | -0.0302 |
| | | (-0.8560) | (-0.6003) | (-0.2547) |
| 18 Dec 2012 | ANC elective conference | -0.0198* | -0.0118 | -0.0099 |
| | | (-1.8123) | (-1.3856) | (-1.1870) |
| 17 April 2004 | National elections | -0.0274 | -0.0152 | -0.0193 |
| | | (0.3446) | (0.0055) | (-0.2260) |
| 25 April 2009 | National elections | -0.0134*** | -0.0063*** | 0.0022 |
| | | (-5.7319) | (-4.1970) | (-0.8664) |
| 10 May 2014 | National elections | 0.0042 | -0.0024 | -0.0035 |
| | | (0.8577) | (-0.7846) | (-1.6145) |

Notes: These results use equation 4 for the estimated model. The number in brackets represents the t-test. The critical values are 2.576, 1.960, and 1.645 for 1%, 5%, and 10% respectively. ***, **, * represents significance at 1%, 5%, and 10% respectively.

## .1 Models

$$\Delta E_t = \alpha_0 + \beta_0 \Delta E_{t-1} + \varepsilon_t \tag{8}$$

$$\Delta E_t = \alpha_0 + \beta_0 \Delta F_{t-1} + \varepsilon_t \tag{9}$$

$$\Delta E_t = \alpha_0 + \beta_0 \Delta (i - i^*)_t + \varepsilon_t \tag{10}$$

$$\Delta E_t = \alpha_0 + \beta_0 \Delta E_{t-1} + \beta_1 \Delta (i - i^*)_t + \varepsilon_t \tag{11}$$

$$\Delta E_t = \alpha_0 + \beta_0 \Delta F_{t-1} + \beta_1 \Delta (i - i^*)_t + \varepsilon_t \tag{12}$$

$$\Delta E_t = \alpha_0 + \beta_0 \Delta E_{t-1} + \beta_1 \Delta E_{t-2} + \beta_2 \Delta F_{t-1} + \beta_3 \Delta (i - i^*)_t + \varepsilon_t \tag{13}$$

$$\begin{aligned} \Delta E_t \quad = \quad & \alpha_0 + \beta_0 \Delta E_{t-1} + \beta_1 \Delta E_{t-2} + \beta_2 \Delta F_{t-1} + \beta_3 \Delta (i - i^*)_t \\ & + \beta_4 \Delta (i - i^*)_{t-1} + \varepsilon_t \end{aligned} \tag{14}$$

where $\Delta$ represents change, $E_t$ is the spot exchange rate at time t, $F_{t-1}$ is the one-lagged forward exchange rate, $E_{t-1}$ and $E_{t-2}$ are one-lagged and two-lagged spot exchange rates, i is the domestic interest rate, $i^*$ is the foreign interest rate, $\alpha_0$ and $\beta_{0,\ldots,4}$ are parameters and $\varepsilon_t$ is the error term.

Table 11: Impact of monetary policy announcements on South African rand

| | | CAR on Day 0 | | |
|---|---|---|---|---|
| Event Date | Announcement | R/$ | R/£ | R/€ |
| 21Sept2000 | MPC no Δ | -0.0135(-0.8732) | 0.0222(7.8419)*** | 0.0273(2.4844)*** |
| 14June2001 | MPC↓ 100*bps* | -0.0100(-3.1508)*** | 0.0020(0.5866) | 0.0037(1.5680) |
| 15Nov2001 | MPC no Δ | -0.0152(-3.2819)*** | -0.0252(-2.6000)*** | -0.0155(-1.4463) |
| 14Mar2002 | MPC↑ 100*bps* | 0.0143(1.4130) | 0.0269(2.1306)** | 0.0277(2.8719)*** |
| 13June2002 | MPC↑ 100*bps* | 0.0353(3.2110)*** | 0.0360(2.9272)*** | 0.0325(2.1628)** |
| 14Aug2003 | MPC↑ 100*bps* | -0.0117(-0.8750) | -0.0218(-1.7556)* | -0.0169(-1.0148) |
| 16Oct2003 | MPC↓ 150*bps* | 0.0293(1.0458) | 0.0324(2.1783)** | 0.0270(1.5791) |
| 10June2004 | MPC no Δ | -0.0099(-0.7542) | -0.0173(-8.2969)*** | -0.0165(-3.0384)*** |
| 12Aug2004 | MPC↓ 50*bps* | 0.0189(0.3207) | 0.0385(1.3511) | 0.0501(1.8881)* |
| 14Oct2004 | MPC no Δ | -0.0279(-3.7233)*** | -0.0162(-2.6624)*** | -0.0092(-1.0480) |
| 9Dec2004 | MPC no Δ | -0.0075(-15.847)*** | -0.0161(-3.8253)*** | -0.0134(-11.085)*** |
| 10Feb2005 | MPC no Δ | -0.0208(-5.2982)*** | -0.0180(-3.0656)*** | -0.0157(-2.9695)*** |
| 14Apr2005 | MPC↓ 50*bps* | 0.0191(0.6337) | 0.0257(2.0536)** | 0.0313(6.7101)*** |
| 8Dec2005 | MPC no Δ | 0.0112(3.7562)*** | 0.0203(4.1917)*** | 0.0182(2.9409)*** |
| 12Oct2006 | MPC↑ 50*bps* | -0.0334(-48.576)*** | -0.0318(-21.898)*** | -0.0346(-12.546)*** |
| 15Feb2007 | MPC no Δ | 0.0007(0.5898) | -0.0065(-6.2099)*** | -0.0018(-0.3079) |
| 12Apr2007 | MPC no Δ | 0.0090(15.412)*** | 0.0107(3.2137)*** | 0.0151(5.3698)*** |
| 10Apr2008 | MPC↑ 50*bps* | -0.0068(-27.158)*** | -0.0006(-0.5837) | 0.0030(0.4104) |
| 12June2008 | MPC↑ 50*bps* | 0.0178(15.443)*** | 0.0016(1.0022) | -0.0018(-1.2063) |
| 22Jul2010 | MPC no Δ | -0.0136(-1.1731) | 0.0008(0.0455) | -0.0075(-2.0202)** |
| 9Sept2010 | MPC↓ 50*bps* | -0.0137(-6.7991)*** | -0.0148(-6.7399)*** | -0.0142(-70.934)*** |
| 18Nov2010 | MPC↓ 50*bps* | -0.0030(-3.5643)*** | 0.0024(1.0932) | 0.0069(48.981)*** |
| 24Mar2011 | MPC no Δ | -0.0137(-1.3823) | -0.0254(-2.6269)*** | -0.0121(-8.3982)*** |
| 19Jul2012 | MPC↓ 50*bps* | 0.0570(1.0461) | 0.0173(8.0032)*** | 0.0315(1.2376) |
| 22Nov2012 | MPC no Δ | -0.0147(-8.6255)*** | -0.0109(-5.8503)*** | -0.0060(-17.084)*** |
| 22May2014 | MPC no Δ | -0.0120(-5.5552)*** | -0.0145(-7.9642)*** | -0.0139(-10.778)*** |
| 17Jul2014 | MPC ↑ 25*bps* | -0.0009(-0.7539) | -0.0060(2.6807)*** | -0.0018(-1.4113) |
| 20Nov2014 | MPC no Δ | -0.0128(-1.4940) | -0.0081(-1.2159) | -0.0211(-18.642)*** |

Notes: The number in brackets represents the t-test. ***,**,* represents significance at 1%, 5%, and 10% respectively. These results are based on the estimated model using equation 3 . Δ=change. bps= basis points. ↑ and ↓ refers to an increase and a reduction respectively.

Table 12: Impact of monetary policy announcements on South Africa rand (2)

| | | CAR on Day 0 | | |
|---|---|---|---|---|
| Event Date | Announcement | R/$ | R/£ | R/€ |
| 21Sept2000 | MPC no Δ | -0.0135(-0.8730) | 0.0222(7.8394)*** | 0.0273(2.4804)** |
| 14June2001 | MPC↓ 100*bps* | -0.0101(-3.1744)*** | 0.0020(0.5829) | 0.0037(1.5590) |
| 15Nov2001 | MPC no Δ | -0.0153(-3.2861)*** | -0.0252(-2.6023)*** | -0.0155(-1.4482) |
| 14Mar2002 | MPC↑ 100*bps* | 0.0143(1.4128) | 0.0269(2.1287)** | 0.0277(2.8714)*** |
| 13June2002 | MPC↑ 100*bps* | 0.0352(3.2079)*** | 0.0360(2.9322)*** | 0.0326(2.1667)** |
| 14Aug2003 | MPC↓ 100*bps* | -0.0117(-0.8722) | -0.0218(-1.7500)* | -0.0169(-1.0128) |
| 16Oct2003 | MPC↓ 150*bps* | 0.0293(1.0463) | 0.0325(2.1796)* | 0.0270(1.5785) |
| 10June2004 | MPC no Δ | -0.0099(-0.7543) | -0.0173(-8.3924)*** | -0.0165(-3.0492)*** |
| 12Aug2004 | MPC↓ 50*bps* | 0.0189(0.3208) | 0.0386(1.3572) | 0.0501(1.8873)* |
| 14Oct2004 | MPC no Δ | -0.0279(-3.7150)*** | -0.0162(-2.6589)*** | -0.0092(-1.0482) |
| 9Dec2004 | MPC no Δ | -0.0075(-15.481)*** | -0.0161(-3.8556)*** | -0.0134(-10.843)*** |
| 10Feb2005 | MPC no Δ | -0.0208(-5.2740)*** | -0.0180(-3.0681)*** | -0.0157(-2.9715)*** |
| 14Apr2005 | MPC↓ 50*bps* | 0.0191(0.6366) | 0.0257(2.0453)** | 0.0313(6.6096)*** |
| 8Dec2005 | MPC no Δ | 0.0112(3.8082)*** | 0.0203(4.1351)*** | 0.0182(2.9106)*** |
| 12Oct2006 | MPC↑ 50*bps* | -0.0334(-48.370)*** | -0.0318(-21.868)*** | -0.0346(-12.527)*** |
| 15Feb2007 | MPC no Δ | 0.0007(0.5892) | -0.0065(-6.2730)*** | -0.0018(-0.3093) |
| 12Apr2007 | MPC no Δ | 0.0090(15.762)*** | 0.0107(3.2178)*** | 0.0151(5.3360)*** |
| 10Apr2008 | MPC↑ 50*bps* | -0.0068(-27.656)*** | -0.0006(-0.5826) | 0.0030(0.4102) |
| 12June2008 | MPC↑ 50*bps* | 0.0178(15.466)*** | 0.0016(0.9957) | -0.0018(-1.2114) |
| 22Jul2010 | MPC no Δ | -0.0136(-1.1741) | 0.0008(0.0448) | -0.0075(-2.0297)** |
| 9Sept2010 | MPC↓ 50*bps* | -0.0137(-6.7738)*** | -0.0148(-6.7638)*** | -0.0142(-66.359)*** |
| 18Nov2010 | MPC↓ 50*bps* | -0.0030(-3.5599)*** | 0.0025(1.0826) | 0.0069(60.250)*** |
| 24Mar2011 | MPC no Δ | -0.0137(-1.3839) | -0.0254(-2.6226)*** | -0.0121(-8.3695)*** |
| 19Jul2012 | MPC↓ 50*bps* | 0.0570(1.0455) | 0.0173(7.9927)*** | 0.0315(1.2361) |
| 22Nov2012 | MPC no Δ | -0.0147(-8.6165)*** | -0.0109(-5.8222)*** | -0.0060(-17.330)*** |
| 22May2014 | MPC no Δ | -0.0119(-5.5216)*** | -0.0145(-7.9352)*** | -0.0139(-10.734)*** |
| 17Jul2014 | MPC↑ 25*bps* | -0.0007(-0.7506) | -0.0060(-2.6818)*** | -0.0018(-1.4096) |
| 20Nov2014 | MPC no Δ | -0.0128(-1.5000) | -0.0081(-1.2175) | -0.0212(-18.610)*** |

Notes: The number in brackets represents the t-test. ***,**,* represents significance at 1%, 5%, and 10% respectively. These results are based on the estimated equation 4.

Δ=change. bps= basis points. ↑ and ↓ refers to an increase and a reduction respectively.