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Policy in South Africa**

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Qualitative Guidance and Predictability of Monetary Policy in South Africa*

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Abstract

This paper investigates the impact of "rising cycle" talk on the predictability of the likely future path of the policy rate in South Africa. Throughout 2014 the South African Reserve Bank (SARB) explicitly communicated that monetary policy was on a rising cycle until normalisation is reached. Given that the "rising cycle" talk occurred early in 2014, we compare the forecasts in 2013 to those in 2014. We use two sources of expectations, the survey of economic experts obtained from Thomson Reuters and the Forward Rate Agreements (FRAs) which represent the expectations of the financial market participants. The results based on descriptive analysis and a nonparametric change points model confirm the influence of the "rising cycle" talk in shaping expectations of both economic experts and financial market participants on the future path of the reaction function of the SARB. Besides the surprise effects of January 2014, agents clearly predicted subsequent rate hikes based on the guidance received from the SARB. Previous rising interest rate cycles do not portray the same degree of predictability by analysts.

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Keywords: Monetary policy, Central Bank Communication, Nonparametric Change Point.

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1 Introduction

With the adoption of the inflation targeting (IT) regime in 2000, the South African Reserve Bank (SARB) became independent. With the independence of monetary policy comes accountability to the public at large, which in turn leads to transparency in the conduct of monetary policy. The SARB has come a long way in its communication strategy. In 2014 it adds another layer in its communication strategy by announcing explicitly throughout 2014 that monetary policy was on the rising cycle until normalisation is reached. Monetary policy committee (MPC) statements of March and May 2014 refer to normalisation as the return of the policy rate (repo rate) from the historical lowest level of 5 per cent to the normal level in the long run. Like many central banks, the SARB reduced the policy rate from 12 per cent to 5 per cent following the Global Financial Crisis (GFC).

Against this backdrop, this paper assesses the effectiveness of the change in communication on the predictability of monetary policy by the financial market participants. Even though most economic agents¹ were surprised by the 50 basis points interest rate hike in January 2014, they have since largely predicted subsequent policy actions. We use both the survey conducted by Thomson Reuters on a poll of economic experts and financial markets expectations about the future monetary policy, represented by different Forward Rate Agreements (FRAs) to examine the effectiveness of qualitative guidance by the SARB. We first conduct a descriptive analysis based on predictions of the two groups. We compare the outcomes of survey data in 2013 to the 2014 values in order to highlight to impact of new communication strategy. Furthermore, we use the difference in FRAs before and after each meeting to avoid the possible contamination that may arise because of other information inherent in the FRAs. In so doing, we have a better picture of surprise effects of change in monetary policy on the financial market. This analysis is augmented by the event study based on short-term yield curves of FRAs of different maturities calculated a day before the decision and three days after the decision. But this analysis is incapable of identifying the surprise that may arise because of distributional change in the FRAs. We address this question with a nonparametric analysis of change points which can easily identify multiple breaks due to both changes in locations and changes in distributions. In addition, we compare these results with the 2007-2008 rising interest rate cycle period. The results show that agents predict the

¹See surveys of economists by Bloomberg on the 23rd of January 2014, i.e. few days before the MPC meeting.

SARB move with higher accuracy in the latter period, i.e. 2014, relative to the previous period.

Aron and Muellbauer (2007) attest that there is a strong increase in transparency and accountability of monetary policy in South Africa since the adoption of inflation rate targeting framework. Similarly, the transparency index developed by Dincer and Eichen-green (2014) ranks South Africa high in terms of transparency, on par with countries such as South Korea, Hong Kong, Chile, but above Argentina, Brazil, India, Mexico, and Singapore. It scores just below Australia, Israel, and New Zealand. The SARB added another dimension in its communication by providing qualitative guidance of the future path of policy rate. For example, in 2013 the SARB was clear in all its statements about the balance risks to inflation and output growth forecasts. The market interpreted rightly that it was less likely that the policy rate would change. After the first rate hike in January 2014, it announced that monetary policy was on a rising cycle until normalisation is achieved. This type of communication fits perfectly the description of the qualitative guidance of monetary policy. Moreover, in the MPC statement of July 2015 the SARB adds another layer in transparency by publishing assumptions underlying the forecast of key macroeconomic variables.

There are three main approaches central banks have used since the 1990s to communicate their reaction function in a transparent way. Most central banks give qualitative statements about the likely future path of the policy rate. This strategy was followed by the Norges Bank before moving to the explicit communication approach. Similarly the Federal Reserve and the European Central Bank (ECB) used it prior to the financial crisis of 2008. The second approach is the publication of the central bank forecasts of its policy rate. This approach is currently followed by New Zealand, Norway, Sweden, the Czech Republic, Iceland, and the Bank of Israel. Andersson and Hofmann (2010) and Kool and Thornton (2012) argue that there is no consensus regarding the effectiveness of this approach. According to these authors the release of policy rate forecasts by central banks has been effective for Norway and Sweden, but it did not improve the predictability of monetary policy in New Zealand. But Svensson (2015) refutes this view and shows clearly that the explicit guidance is more effective in New Zealand than it was in Sweden in September of 2011. The final method, forward guidance, has been adopted by the Federal Reserve, the bank of England, the Bank of Japan, and the ECB in the wake of the great recession. Like the first approach, there is little empirical evidence for the effectiveness of forward guidance. While it has been effective when the policy rate is at the zero low bound (ZLB) for the US, it was less successful in Sweden.² The forward guidance policy combined with large-scale purchases of long-term securities by the Fed-

²See Blanchard, Dell'Aiccia, and Mauro (2013).

eral Reserve have contributed to keeping the long-term interest rate low and gradually pushing inflation expectations within the central bank target of 2%. With this policy the Federal Reserve has demonstrated the effectiveness of monetary policy even when the short-term interest rate is at the ZLB.

Besides the study of Aron and Muellbauer (2007) little empirical works have examined the predictability of monetary policy by market participants in South Africa. Many studies to date emphasise on the impact of monetary policy in anchoring inflation expectations.³ The current study bridges the gap existing in literature. The remainder of the paper is organised as follows. Section 2 describes the methodology used in the empirical section in identifying change in the break point in the 1x4FRA. Section 3 discusses the data and the results obtained. It starts with the analysis of forecasts of the repo rate based on the Reuter’s survey data, then proceeds with the study of FRAs. Section 4 concludes the paper.

2 Methodology: Nonparametric for Multiple Change Point

A surprise in monetary policy announcement can be understood in statistical parlance as a change in distribution in the underlying data – in our case in the FRAs. If we are able to detect changes in the distributions of the FRAs that coincide with the SARBs monetary policy meetings then those changes can be qualified as surprises. The aim becomes then to find the change points.

Change points are detected either with parametric or nonparametric methods. On the one hand, the parametric approaches rely on assuming that the data come from a known distribution, usually the normal. Then they proceed to examine the log-likelihood for change points. On the other hand, the nonparametric approach has distribution free assumptions, which is an advantage over the parametric. The approach usually estimates density functions, but it is not unusual for the rank statistics to be used (Matteson and James, 2014).

Irrespective of the approach different assumptions are made about the locations and number of change points. Table 1 shows the various assumptions that can be made. For instance, a researcher might be aware apriori of the number change points but not their locations. To a large extent the assumptions will dictate the methods that are used. Our case is consistent with block number 4, that is, unknown location(s) and number of

³See for example, Kabundi and Schaling (2013), Kabundi, Schaling, and Some (2015), and Reid (2015).

change points.

Table 1: Assumptions about Location and Change Points

	Known Number of Change Points	Unknown Number of Change Points
Known Location(s)	1	2
Unknown Location(s)	3	4

Against this backdrop, we use the E-divisive algorithm proposed by Matteson and James (2014, henceforth MJ) to identify both the location and number of points for the 1x4FRAs. In general, the algorithm is a nonparametric method that employs techniques from cluster analysis, and also uses a bisection procedure for computational efficiency. Succinctly the algorithm proceeds as follows. First, k clusters are formed. Thereafter, a divergence measure is estimated within each k cluster. If a divergence measure for cluster k is significant, then there is a change point in that cluster.

Suppose there is an independent sequence $\{Z_1, Z_2, \dots, Z_T\} \in R^d$ and let τ be a change point location. Assume that both the numbers and locations of the change points are unknown. Since underpinning the determination of a change point is a difference in distributions, it thus becomes important to be able to identify this difference. To arrive at such a measure, consider random variables $X, Y \in R^d$ that have ϕ_x and ϕ_y as their characteristic functions respectively. $\phi(\cdot)$ is complex-valued function with conjugate $\bar{\phi}$ where the absolute square $|\phi|^2$ is defined as $\bar{\phi}\phi$. Also define the Euclidean norm of $x \in R^d$ as $|x|_d$.

From the above, it is possible to define a divergence measure between multivariate distributions as:

$$\int_{R^d} |\phi_x(t) - \phi_y(t)|^2 w(t) dt \quad (1)$$

where $w(t)$ is an arbitrary positive weight function for which the above integral exists. Using the weight function proposed by Székely and Rizzo (2005) and MJ, we have:

$$w(t; \alpha) = \left(\frac{2\pi^{d/2}\Gamma(1 - \alpha/2)}{\alpha 2^\alpha \Gamma((d + \alpha)/2)} |t|^{d+\alpha} \right)^{-1} \quad (2)$$

Combining (1) and (2) we can express the divergence measure as follows:

$$D(X, Y; \alpha) = \int_{R^d} |\phi_x(t) - \phi_y(t)|^2 \times \left(\frac{2\pi^{d/2}\Gamma(1 - \alpha/2)}{\alpha 2^\alpha \Gamma((d + \alpha)/2)} |t|^{d+\alpha} \right)^{-1} dt \quad (3)$$

if $E|X|^\alpha, E|Y|^\alpha < \infty$ and $\alpha \in (0, 2)$.

Now consider $X, X' \stackrel{iid}{\sim} F_x$ and $Y, Y' \stackrel{iid}{\sim} F_y$, and let X, X', Y and Y' be mutually independent.⁴ Following Székely and Rizzo (2005), if $E|X|^\alpha, E|Y|^\alpha < \infty$, it is possible to

⁴Note that X' and Y' are independent copies of X and Y respectively.

use alternative divergence measure based on the Euclidean distance as:

$$\varepsilon(X, Y; \alpha) = 2E|X - Y|^\alpha - E|X - X'|^\alpha - E|Y - Y'|^\alpha \quad (4)$$

Székely and Rizzo (2005) prove that $D(X, Y; \alpha) = \varepsilon(X, Y; \alpha)$. This result makes it possible to arrive at a simple empirical divergence measure for multivariate distributions based on U -statistics.

Let $X_n = \{X_i : i = 1, \dots, n\}$ and $Y_m = \{Y_j : j = 1, \dots, m\}$ be independent samples from the distribution of $X, Y \in R^d$, respectively, such that $E|X|^\alpha, E|Y|^\alpha < \infty$ for some $\alpha \in (0, 2)$. Then an empirical divergence measure analogous to $\varepsilon(X, Y; \alpha)$ may be defined as:

$$\hat{\varepsilon}(X_n, Y_m; \alpha) = \frac{2}{mn} \sum_{i=1}^n \sum_{j=1}^m |X_i - Y_j|^\alpha - \binom{n}{2}^{-1} \sum_{(1 \leq i < k \leq n)} |X_i - X_k|^\alpha - \binom{m}{2}^{-1} \sum_{(1 \leq j < k \leq m)} |Y_j - Y_k|^\alpha \quad (5)$$

The divergence measure in Equation (5) can be used to determine a change point location τ . Given Equation (5) and let $1 \leq \tau < \kappa \leq T$ be constants, then a change point location can be estimated as follows:

$$(\hat{\tau}, \hat{\kappa}) = \arg \max_{(\tau, \kappa)} \frac{mn}{m+n} \hat{\varepsilon}(X_\tau, Y_\tau; \alpha) \quad (6)$$

To estimate the change points, suppose that $k-1$ change points have been estimated with locations $0 < \hat{\tau}_1 < \dots < \hat{\tau}_{k-1} < T$. As a result we have k clusters such that

$$\hat{C}_i = \{Z_{\hat{\tau}_{i-1}+1}, \dots, Z_{\hat{\tau}_i}\} \quad (7)$$

where $\hat{\tau}_0 = 0$ and $\hat{\tau}_k = T$. Within each i^{th} cluster \hat{C}_i denote $\hat{\tau}(i)$ and $\hat{\kappa}(i)$ then let

$$i^* = \arg \max_{i \in \{1, \dots, k\}} \frac{mn}{m+n} \hat{\varepsilon}(X_{\hat{\tau}(i)}, Y_{\hat{\tau}(i)}(\hat{\kappa}(i)); \alpha) = \arg \max_{i \in \{1, \dots, k\}} \hat{\Theta}(X_{\hat{\tau}(i)}, Y_{\hat{\tau}(i)}(\hat{\kappa}(i)); \alpha) \quad (8)$$

where $X_{\hat{\tau}(i)}$ and $Y_{\hat{\tau}(i)}$ are in cluster \hat{C}_i , and with the associated test statistic

$$\hat{q}_k = \arg \max_{i \in \{1, \dots, k\}} \hat{\Theta}(X_{\hat{\tau}_k}, Y_{\hat{\tau}_k}(\hat{\kappa}_k); \alpha) \quad (9)$$

in which $\hat{\tau}_k = \hat{\tau}(i^*)$ denotes the k^{th} estimated change point in cluster \hat{C}_{i^*} and $\hat{\kappa}_k = \hat{\kappa}(i^*)$ is the corresponding constant.

From the above within each cluster there are a set of potential change points \hat{q}_k . To determine which among \hat{q}_k the is significant in cluster \hat{C}_{i^*} is a change point, MJ propose a permutation test. The test is conducted, under the null hypothesis of no additional change points, as follows:

1. The observations within each cluster are permuted to construct a new sequence of length T ;
2. A set of change points estimated with the associated $\hat{q}_k^{(r)}$ are recorded; and
3. Repeat 1 and 2, R times

MJ fix $p_0 \in (0, 1)$ of the conditional test, the number of permutations is set at R and the p -value is approximated by $\# \left\{ r : \hat{q}_k^{(r)} \geq \hat{q}_k \right\} / (R + 1)$.

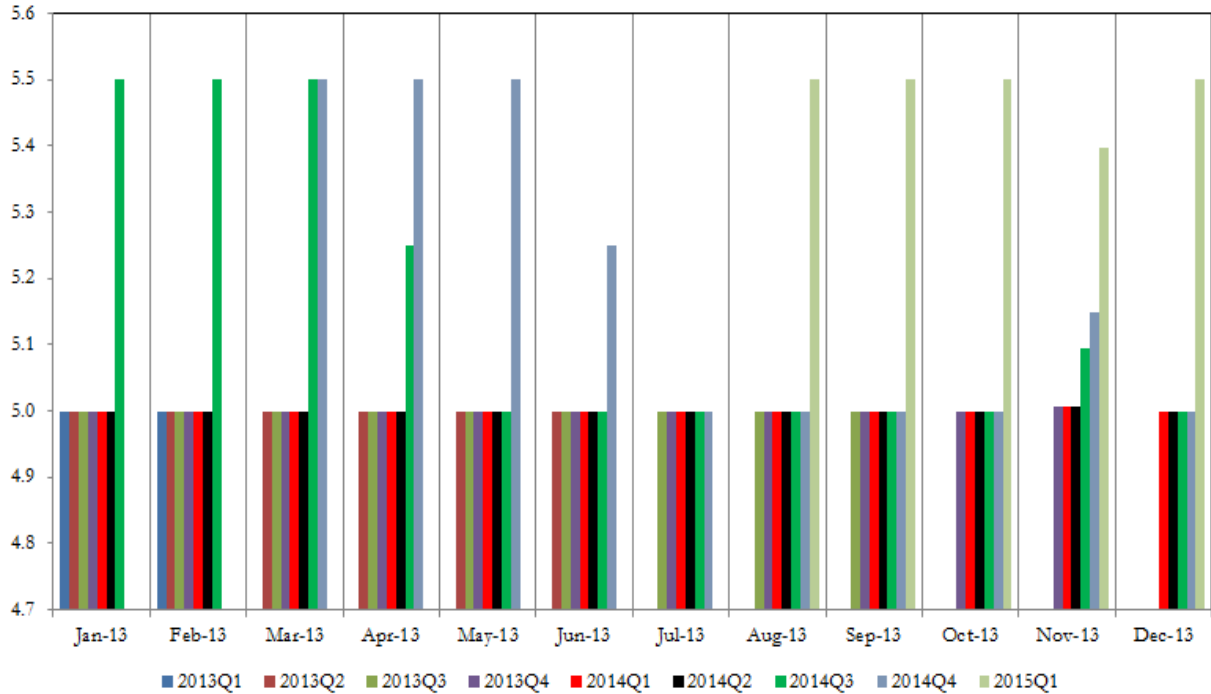
3 Data and Empirical Results

This paper uses two sets of market expectations about the future monetary policy, namely, the surveys from Reuters and different measures of Forward Rate Agreements (FRAs). The Reuters survey includes quarterly forecasts of the repo rate over the next two years. The poll takes place every month on a panel of about forty economists. Given the short-term forecasting horizon of the survey, the current study focuses on short-term prediction rather than long-term prediction of monetary policy. We use the median forecasts for 2013 and 2014. Similarly, we use up to two-year prediction based on financial market expectations, represented by FRAs. For example, the 1x4FRA is the one-month expectation of the three-month JIBAR, while the 2x5FRA and the 3x6FRA are two- and three-month expectation of the three-month JIBAR, respectively. We consider thirteen different measures of FRAs with maturity varying from one month up to two years. Many studies on the predictability are based on financial market expectations.⁵ However the main criticism of the analysis based on FRAs is that it relies on the expectation hypothesis of the term structure of interest rates which has been proven to have some shortcomings. The main weakness of using FRAs is that they include the term premia which makes them imperfect predictor of future policy rate. However, the analysis based on Reuter's survey does not provide a complete picture predictability of monetary policy as they are expressed only at the lower frequency compared with daily or even intra-daily nature of FRAs. In addition, the forecasting horizon of survey is quarterly, while the forecasting horizon of FRAs varies from one month to two years. To better understand the impact of the "rising cycle" talk since 2014, the current study uses both the survey based expectations and the expectations of the financial market.

⁵Just to name but a few, Kuttner (2001), Sellon (2008), Swanson (2006), Gürkaynak, Sack, and Swanson (2007), and Piazzesi and Swason (2008).

3.1 Reuters Survey Expectations

Figure 1: Expectations of Economic Experts in 2013



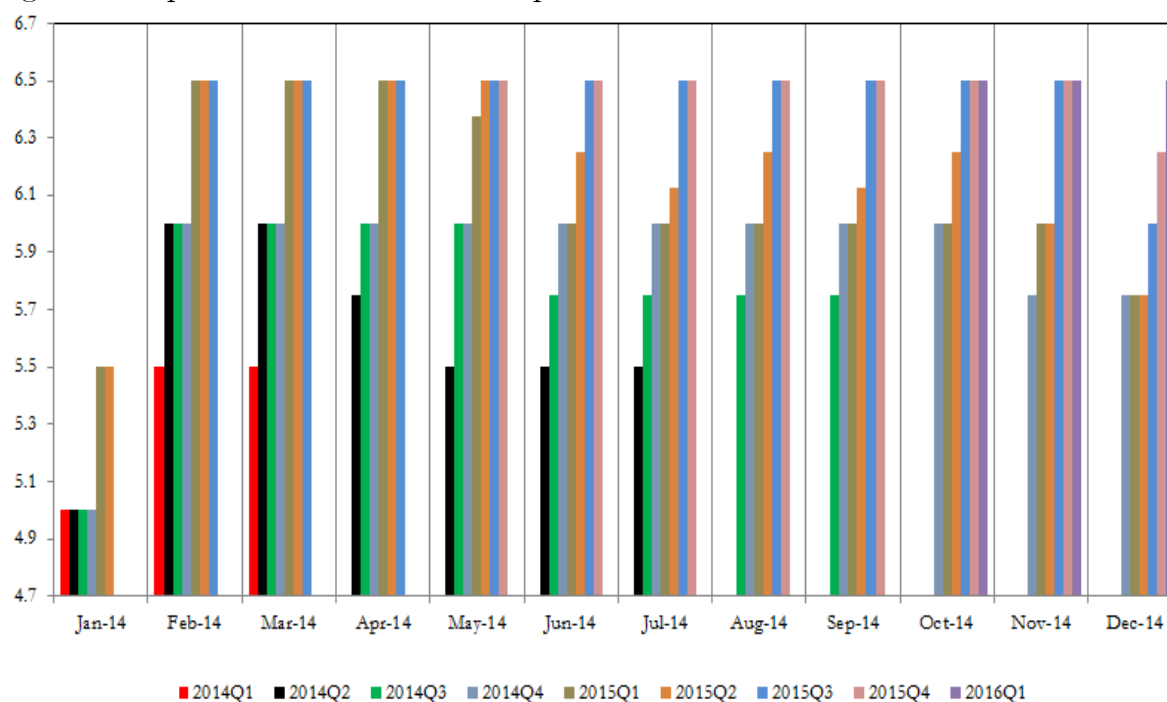
Source: Thomson Reuters

Figure 1 shows the expectations of experts for 2013. It is clear that economic agents expected the SARB to keep the repo rate unchanged at 5% for the entire period until the third quarter of 2014. The economic condition prevailing during this period was of weak economic activity as depicted by low economic growth rate and relatively high inflation rate, closer the upper bound of the official target band of 3 to 6%. As indicated in all Monetary Policy Committee (MPC) statements, the SARB was faced with the dilemma of pursuing an accommodative policy to support the weaker economy or dealing with inflation pressure caused by a weaker currency. The main challenge of choosing the first option was the higher probability of bridging the upper bound of the target band which is costly for an inflation targeting central bank.

On the other hand raising the policy rate to bring inflation under control would jeopardise the economy recovery under way. Hence, the appropriate policy for a flexible inflation targeting central bank was to keep the policy rate unchanged. Importantly, the expectations remained constant in May of 2013 after the Fed announced the exit of the accommodative monetary policy pursued since 2012 with massive purchase of long-term assets, which in turn generated a significant increase in volatility in most of financial markets of Emerging Market Economies (EMEs) caused by capital reversals.

The SARB communication was clear and the market anticipated correctly the policy followed in 2013. It is evident in Figure 2 that agents were surprised with the rate hike of January 2014. Their predictions point to the first rate hike in the first quarter of 2015. It is generally difficult to predict with high accuracy the turning point of policy.

Figure 2: Expectations of Economic Experts in 2014



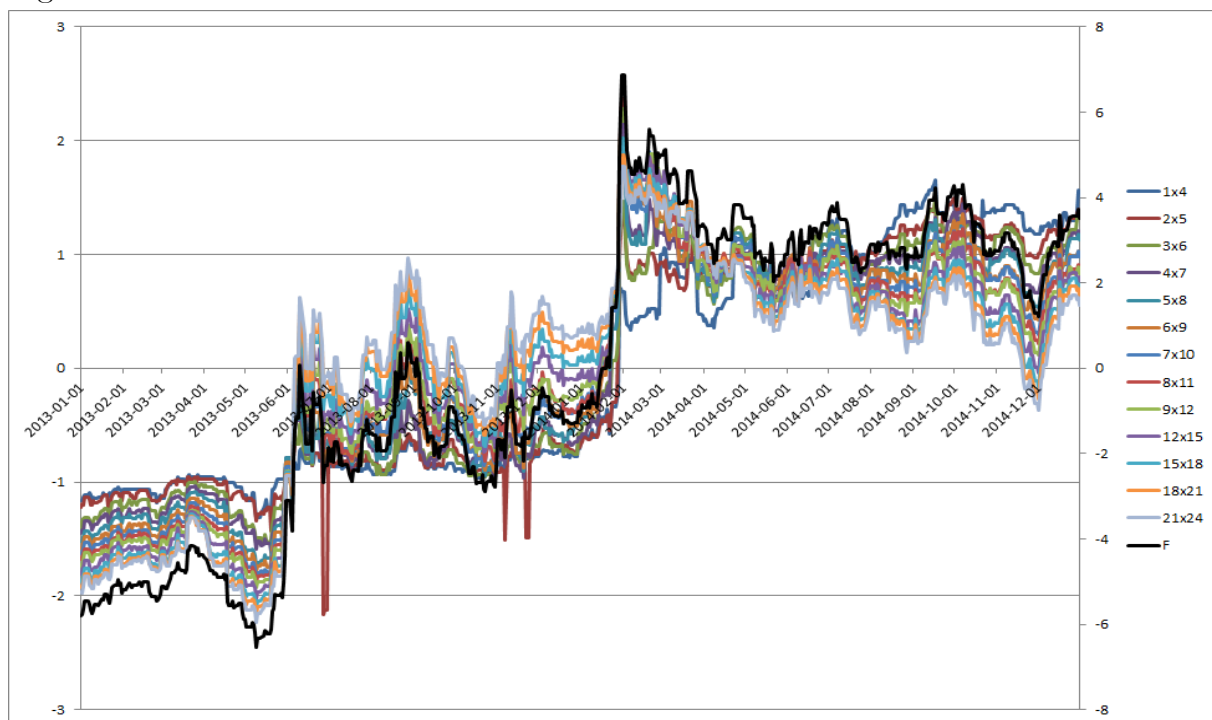
Source: Thomson Reuters

Figure 2 reveals a sudden change in expectations of future monetary policy from February 2014 onward. From February to September 2014, agents forecast a rise in the interest rate in the following quarter. But the October and December surveys exhibit a pause in the first quarter and both first and second quarters of 2015, respectively. In the meantime their predictions about the inflation and the growth outlook for the two years were unchanged compared with those of 2013. The question arises as to why the forecasts in 2014 differ from those in 2013. The answer lies in the change in the trajectory of the reaction function in 2014. The direction of the new cycle was first announced in the MPC statement of March 2014 whereby the SARB stated clearly that it was embarking on a rising cycle until normalisation is achieved. This approach is equivalent with the first communication guidance, namely, the qualitative approach. Figure 2 depicts the immediate impact of change in language with an upward trend in expectations of the future monetary policy.

3.2 Forward Rate Agreements (FRAs)

Figure 3 exhibits standardised measures of FRAs at various maturities. As discussed above, we focus on short maturity, up to two years, to avoid the deterioration in forecasting commonly present in long-term prediction of future policy rate. The graphical representation depicts a marked comovement in FRAs. The strong relationship is also observed when we consider the common factor derived from a panel of thirteen series.⁶ The factor (F) mimics closely the pattern followed by these expectations and hence it summarises in the information content in the FRAs. In addition, the results in Table 2 indicate that one factor explains considerable variation of all FRAs taken together.⁷ Particularly, the lowest coefficient variation obtained regressing each FRA on the factor is 80%. The correlation with the factor increases with the maturity, from the one-month FRA, reaches the maximum of 99% with the ten-month FRA, and then declines gradually to 82% for the two-year FRA. Hence, the remainder of the analysis focuses on the one-month FRA (1x4FRA).⁸

Figure 3: Comovement in FRAs



⁶The extracted factor is based on principal component analysis of Bai and Ng (2002).

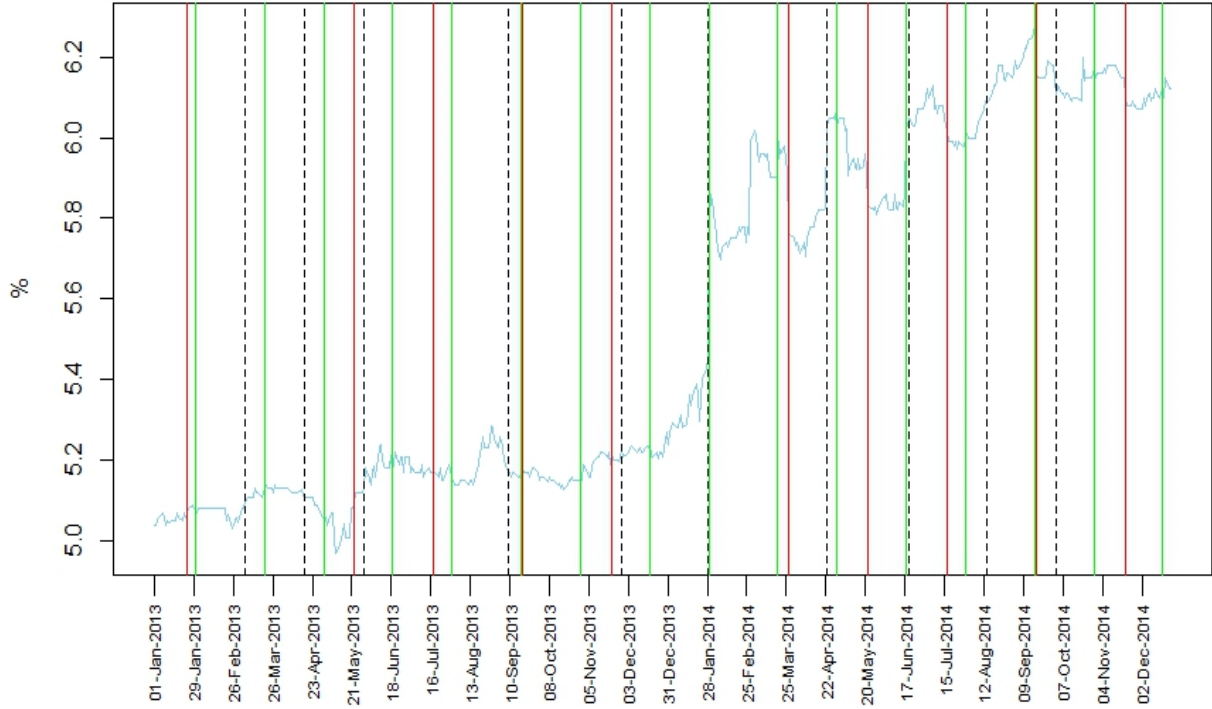
⁷The variance share (VS) of common component is 93%.

⁸The results based on other measures of FRA are qualitatively the same.

Table 2: Variance Share of Common Component

FRAs	Variance Share
7x10	0.996
6x9	0.992
8x11	0.991
9x12	0.985
5x8	0.979
12x15	0.956
4x7	0.955
3x6	0.918
15x18	0.917
18x21	0.870
2x5	0.854
21x24	0.820
1x4	0.797

Figure 4: Daily Movement of 1x4 FRA



Note: Red Line = MPC meetings, Green Line = FOMC meetings, Dotted Black Line: change points

Table 3: Difference in 1x4FRA: A day before and a day after the MPC

Dates	Difference in 1x4 FR
2013-01-24	0.02
2013-03-20	0.02
2013-05-23	0.04
2013-07-18	0.00
2013-09-19	0.00
2013-11-21	0.01
2014-01-29	0.41
2014-03-27	-0.16
2014-05-22	-0.10
2014-07-17	-0.04
2014-09-18	-0.13
2014-11-20	-0.07

Figure 4 plots the 1x4FRA together with the repo rate and dates of MPC meetings. Note that the 1x4FRA was relatively flat throughout 2013. It implies market participants expected the SARB to keep the rate unchanged at 5% for the entire period. The increase in the 1x4FRA in May of 2013 from 4.97% to 5.20% was a consequence of higher uncertainty in EMEs caused by the “taper tantrum”. The economy registered a net capital outflow of about R250 million which in turn put pressure on the domestic currency and the Rand depreciated by approximately 6.00% against the US dollar. The picture portrayed by the expectations of the financial market is consistent with the predictions of experts represented by the Reuters survey.

Subsequently the 1x4FRA remained stable below 5.50% for the rest of the year, followed by an abrupt jump in January 2014 from 5.22% to 5.86% due to the unexpected 50 basis points rise in the repo rate by the SARB. Since then the 1x4FRA has been trending upward, which indicates that market participants predict the SARB will most likely increase the repo rate in the future. This is consistent with the communication by the SARB since the MPC meeting of January 2014.

But as mentioned above the analysis based on the FRAs can be misleading because they include the term premium. One way to circumvent the effects of risks is to highlight the behaviour of expectations specifically on days of MPC decision. Kuttner (2001), Winkelmann, Bibinger, and Linzert (2015), Svensson (2015), and Nowak et al. (2011) use similar approach for the US, the EU, Sweden, and EMEs respectively. Isolating these periods single out the impact of the only event taking place on that day, assuming that there is no other event occurring simultaneously. Table 3 represent the difference in

the 1x4FRA before and after the meeting.⁹ We infer there is no surprise by the market when the difference is small. This actually implies agents have already priced in the behaviour of the future decision of the SARB. Conversely a big difference in the FRA indicates inaccurate prediction of the future move by the central bank.

The results in Table 3 show negligible change in the FRA for the entire period of 2013, which corroborates with the evidence observed from the survey. However, we observe a significant positive shift in expectations in the first meeting of 2014. It again confirms the evidence suggesting that the SARB surprised the market with first rate hike in January. Consistent with Figure 4, negative values depicted in Table 3 indicate that the financial market predicted additional rate hikes in 2014. It is clear in Figure 4 that agents forecasted a rise in the policy at the next meeting, which is on the 27th of March, with an increase in the FRA from 5.78% to 6.00%, then revised it to 5.77% after the meeting following the decision to keep the policy rate unchanged at 5.50%. The downward revision of the FRA is represented by a small negative value in Table 3. We observe similar pattern for the next meeting in May. The FRA increased from 5.82% to 6.03% a month before the meeting, then reverted back to 5.83% after the meeting, again as a result of unchanged policy rate by the SARB. Exactly a month before the July meeting the market agents predicted once more additional rate hike with the FRA increasing from 5.83% to 6.02%, unlike in the two previous meetings, the prediction was met with a 25 basis point rise in the repo rate. The FRA was maintained roughly at this level after the meeting, with just a small decline of 0.04%. The same tendency emerges in the two last meetings of 2014 where we register small downward revision of the FRA, namely, 0.13% and 0.07%, for the September and November meetings, respectively. It is important to note that from March onward, the SARB has explicitly stated in its statements that the monetary policy was on the rising cycle, but it did not mean that it would be increasing the repo rate at each meeting since the decision was mainly data dependent. Obviously, the analysis indicates that agents incorporated this new communication strategy adopted by the SARB, which materialised in the 1x4FRA.

3.3 Short-term Yield curve of FRAs

Like Svensson (2015), we now consider evidence from yield curve of FRAs of maturities varying from one to twelve months. Figure 5 and 6 depict yield curves prevailing at each decision meeting. The blue line indicates the yield curve before the meeting while the rest represents yield curves three days after the meeting. Besides the January and the May meetings where the yield curves are downward sloped, the results in Figure 5 show

⁹ A positive value indicates an increase whereas a negative value is a decrease in the FRA after the meeting.

positively sloped yield curves in 2013. Interestingly, the yield curve was flat prior to the March meeting and steepened upward after the meeting. But from July until the end of 2013, the yield curves display the same upward sloped trend, before and after meetings. In Figure 6, we see a relatively less steeped yield curve in January 2014 compared with curves post meeting. This difference in the shape confirms the surprised behaviour of the market. While the subsequent upward nature of yield curves throughout 2014 point to the impact of increase transparency by the SARB concerning its future policy move. Agents have ever since been pricing an additional rate hike.

3.4 Surprised Effects in 1x4FRA

The analysis in this section is based on a nonparametric method of detecting structural change in time series, proposed by Matteson and James (2014, henceforth MJ), which makes few assumptions about the observed time series. As discussed in Section 2, according to MJ, their approach is capable of detecting any type of distributional change within the data provided that the absolute α^{th} moment exists. Given α , we proceed first by detecting different change points in daily 1x4FRA between 2013 and 2014. Then we identify events which transpired during these specific periods. If the structural breaks coincide with meeting dates, we conclude that the market was surprised by the decision taken by the SARB. We choose this approach instead of the most popular event study proposed by the seminal work of Kuttner (2001). Kuttner approach requires a long sample of meeting dates, which we do not have. In addition, our sample contains only two changes in the repo rate whereas Kuttner has a sizeable sample of surprises for proper statistical inference. The MJ is less sensitive to sample size and no assumption is made concerning the distributional form of FRA.

In classical analysis of variance (ANOVA) and multivariate analysis of variance (MANOVA) the statistical inference assumes independence and identical distribution of the error term with mean of zero and constant variance. The hypothesis of structural break is based on difference in means or locations while the distributions are constant. But in practice the assumptions of normality or common variance do not hold which renders the inference obsolete. Hence, a more inclusive approach entails relaxing this strong restriction by adopting instead a more general approach which does not impose a distributional form to the data. The null hypothesis in this case is that distributions are identical, which implies no structural break in the data. The rejection of the hypothesis indicates a detection of change points. It is important to note that most financial variables violate the normality assumption which is commonly implicit in empirical studies. The violation is evident in the 1x4FRA with the skewness of 0.38 and the kurtosis of 1.39.

In this study we set $\alpha = 1$, which is appropriate when the objective is to assess whether the break is caused by change in distributional form. Similar to MJ and James and Matteson (2014), Rizzo and Székely (2010), and Székely and Rizzo (2005) we choose the number permutations $R = 499$ and the minimum cluster size for the E-Divisive procedure of 30. The results are reported in Figure 6. The MJ approach identifies a total of ten structural breaks in the FRA, five breaks in each year. The black dotted line represents the structural break, the red line corresponds to MPC meetings, and the green line is the Fed meeting. We include the Fed meetings to account for the possibility of US monetary policy impacting South Africa.

First, notice that none of the identified breaks in 2013 coincide with the announcement dates. In addition, they do not follow a certain prescribed pattern. Recall the results in Table 2 find small change in the FRA before and after MPC meetings in 2013. But it is worth identifying different events which occur during these breaks. The first break which happens in March 6 picks up the risk posed by the depreciation of the rand exchange rate caused by idiosyncratic factors such as labour disruption in the mining sector, electricity constraint, and the widening of the current account deficit. This sentiment was echoed by the SARB in its statement of March 20. The trend in the currency was reversed in April 17 marking a new regime in the FRA which lasted for about a month. The third break, on the 30th of May, corresponds with another episode of depreciation of the rand this time due to risks facing most of EMEs caused by the “Taper Tantrum”. But like in most of EMEs currencies the depreciation trend in the rand was reversed in September following the decision by the Fed to delay the tapering. The rand appreciated from 10.4 to the US dollar to 9.7 and remained relatively stable until the end of November. The last break point of 2013 was in November 28, after the last MPC meeting of the year. It represents a sharp depreciation of the rand in response to increase in volatility in the EMEs. Growing risks in EMEs triggered investors panic, resulting in massive portfolio outflows which in turn exert pressure on domestic currencies. The risks came in most part from economic weakening and rising financial risk in China (BIS, 2014). Many central banks in EMEs reacted with contractionary monetary policy to contain severe fall in their currencies. In January 28, 2014, the central bank of Turkey reacted aggressively in an extraordinary meeting to raise the rate by 4.25%. In general, the behaviour of the FRAs in 2013 mimics closely the dynamic in the exchange rate rather than monetary policy.

One day after the decision by the central bank of Turkey, the SARB surprised the market with a 50 basis point increase in the repo rate. Like in all previous approaches, discussed above, the E-Divisive technique equally identifies the surprise by the SARB as the first break point of 2014. Interestingly, notice that the remaining break point do

not coincide with MPC meetings, but they occur roughly a month before the meeting, except for the March meeting.¹⁰ We can infer that the identified break points represent expectations of agents about the future move of the SARB. Notice that we do not have the same pattern in 2013. The difference can be attributed to the change in the trajectory of the policy rate from a constant path to a rising cycle discussed above. For example, on the 26th of February, market participants were anticipating a 25 basis point increase in the repo rate coming the March meeting. But they revised the expectations down after the SARB decided to keep the repo rate at 5.5%. It is obvious in Table 3 that the revision on the 27th was somewhat significant. Similarly, second break point occurs in April 23, a month prior to the May meeting. But agents adjusted their prediction downward in the beginning of May signalling a status quo in policy decision. This prediction did materialise with little effect on the FRA on the meeting date. Nevertheless the MPC statement of May reiterated that monetary policy was still on the rising cycle until normalisation is achieved. This statement exerted financial market participants to revisit once more their prediction of rate hike for the next meeting depicted by an increase in the FRA on June 20, roughly a month before the July meeting. This time around the SARB raised the repo rate by 25 basis points to 5.75%. Notice that unlike the surprise of January, this rate was well-anticipated, thus no break point is identified at this specific event. In addition, the downward revision in the FRA was negligible. Interestingly, the SARB reaffirmed that it was still following a normalisation process, meaning that additional rate hikes were eminent. It is visible from Figure 7 that this message was well-understood by the market as it generated two further break points on August 14 and October 2, almost a month ahead of meetings of September 18 and November 20, respectively. The policy rate was unchanged in both of these meetings, and consequently no structural change was identified. The reaction of the market in September was slightly higher than the one in November, but both were small in magnitude to be identified as break points.

The impact of the "rising cycle" talk becomes even clearer when we conduct the same analysis on a different period of rising cycle. Figure A.2 in the appendix shows a different pattern of structural breaks for the period 2007-2008. First we identify many breaks, of which only two occur on the decision date. Second, one break takes place roughly a month before the meeting, while in 2014 five breaks predicted a change in the policy a month earlier. We therefore conclude that the explicit communication that the policy was in the rising cycle partly explains the difference observed between the two periods.

¹⁰With a minimum cluster size of 20, we can identify an additional break on the 26th of February, which is a month before the March meeting (see Figure A.1 in the Appendix).

Importantly, none of the break identified coincides with the FOMC meetings, except for the January break which occurs at the MPC meeting. It means the breaks in 2013 were uninformative regarding changes in the policy rate. Instead they reflect more the behaviour of the exchange rate which on one hand they are related to events in the US and on the other hand they echo uncertainty in EMEs.

4 Conclusion

This paper analyses the impact of change in communication adopted by the South African Reserve Bank (SARB) in January 2014 on the predictability of monetary policy by economists and financial market participants. The expectations of experts are represented by survey conducted by Reuters and the forecasts of financial market are depicted by the one-month Forward Agreement Rate (1x4FRA). We highlight the impact of the "rising cycle" talk by comparing the expectations of both groups in 2013 and the forecasts made in 2014. The results from the survey show that agents predicted a constant policy rate throughout the year in 2013. However, there is evidence that they did not anticipate the rate hike in January 2014. Subsequently, with the "rising cycle", they forecasted an increase in the repo rate based on message by the SARB stating explicitly that it was embarking on a rising cycle. The experts predict each month policy contraction of 25 basis points for the coming quarters.

The findings from the survey corroborate with the analysis based on the FRA. We show that market participants did not predict a rise in the repo rate in 2013, but besides the surprise decision of January 2014 all subsequent decisions were priced in. From February onward, they continuously revised their forecast of an eminent rate hike, which eventually materialised in July. This trend, in accordance with three last statements confirming that the rising cycle was still in place, lasted until the end of year. The change point analysis reveals that changes observed in 2013 reflect mainly uncertainty in the market portrayed by movement in the exchange rate. However, the changes identified in 2014 depict expectations about the future monetary policy. Besides the point change of January 2014, all other changes occur approximately a month before the MPC meeting. It is therefore essential to note the informative nature of the qualitative guidance as a tool of monetary policy.

Recently the SARB has moved a step further in its communication strategy. It published key assumptions underlying forecasts of main macroeconomic variables. This progress in transparency is a step in the right direction. Together with the qualitative guidance this new development will improve the predictability of monetary policy and thereby make it even more effective.

Figure 5: Short-term Yield Curve for 2013

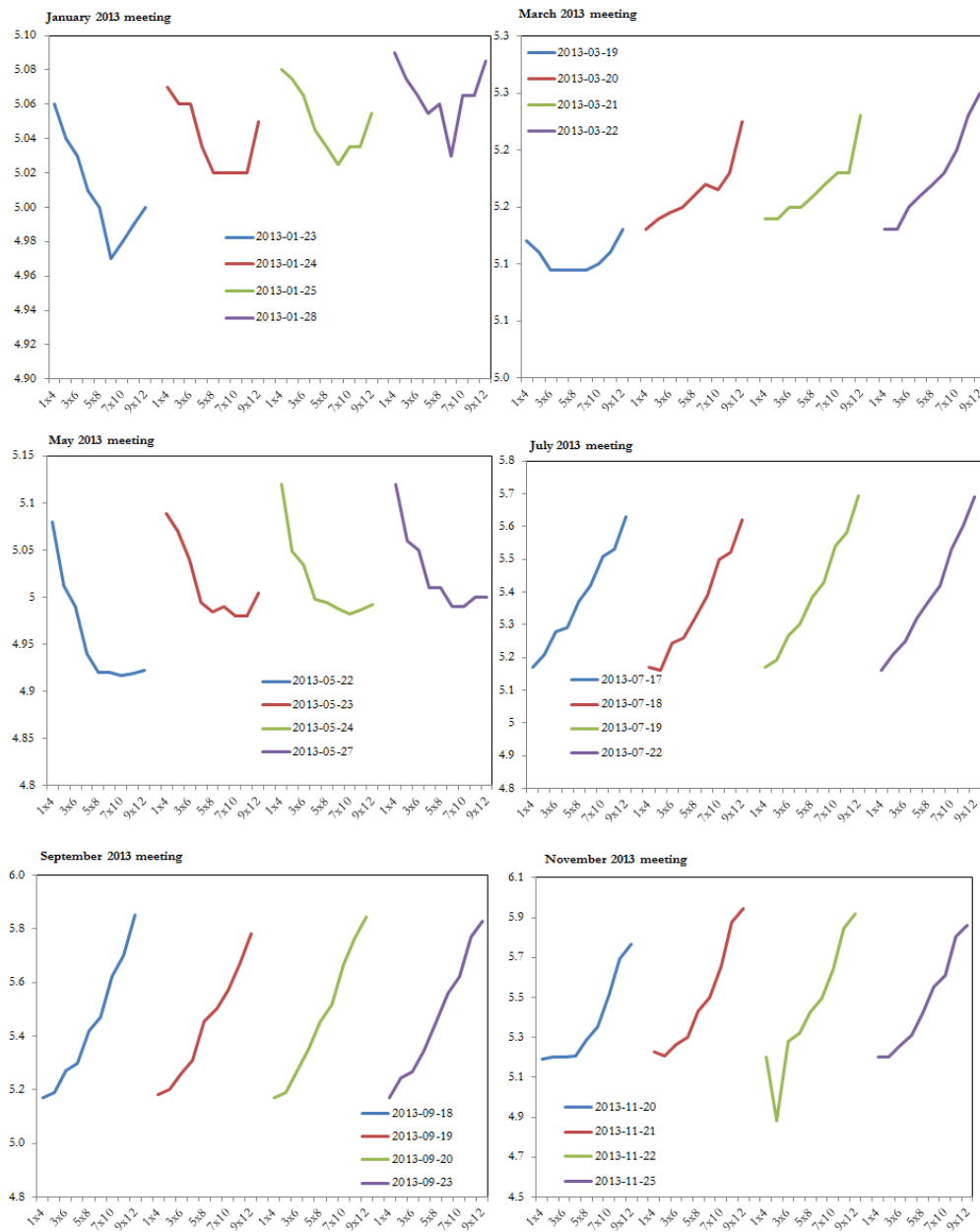
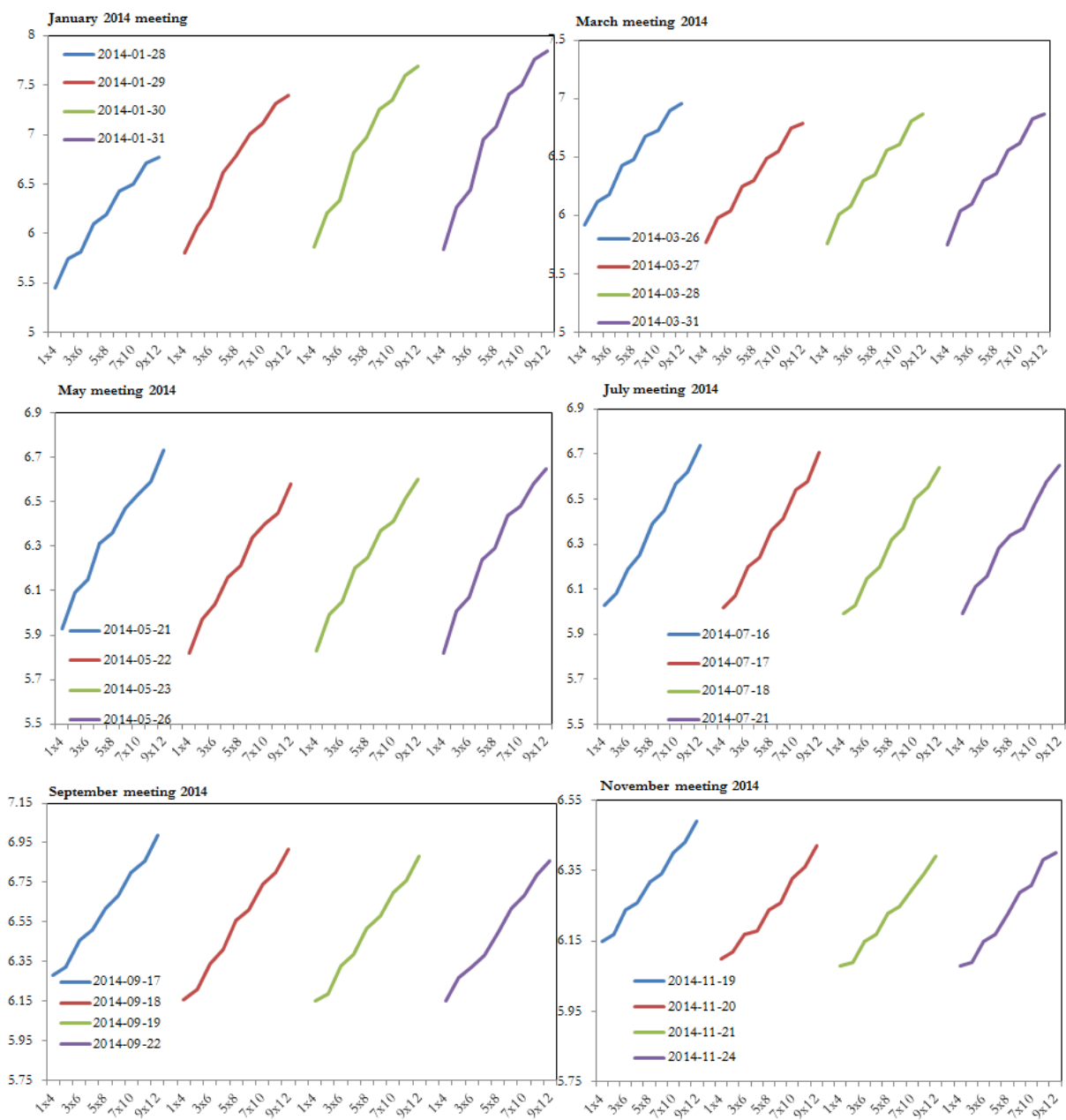


Figure 6: Short-term Yield Curve for 2014



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5 Appendix

Figure A.1: Daily Movement of 1x4 FRA with $\alpha=1$ and size of 20

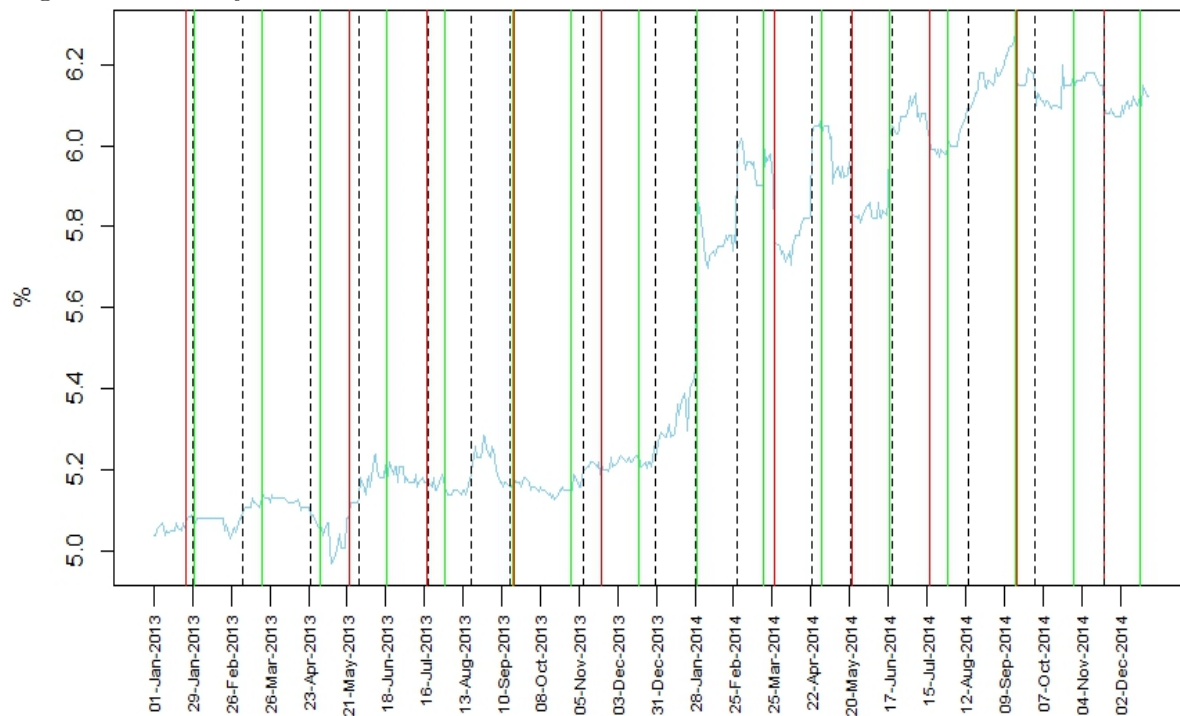


Figure A.2: Daily Movement of 1x4 FRA in 2007-2008

