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Towards more effective monetary policy in the absence of a local currency: An econometric analysis of the efficacy of the Reserve Bank of Zimbabwe's Monetary Policy from 2009 to 2017

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Abstract

While there is a large body of research on monetary policy effectiveness in the conventional setting of countries with local currencies, the existence and potential growth of countries operating without local currencies necessitates the evaluation of monetary policy when countries do not have a local currency. To this end this paper uses event studies using the daily stock prices of the most liquid shares on the Zimbabwean Stock Exchange to evaluate the effectiveness of monetary policy in Zimbabwe in the absence of a local currency from 2009 to 2017. These event studies were based on the foundational work of Brown and Warner (1985) after adjusting for the criticisms of Coutts et al. (1994) and the revisions to the method as documented by De Jong (2007). These studies separated instances where monetary policy had 1 an impact on the stock market in Zimbabwe[1] and cases when it did not. Following this separation, the paper then identified the commonalities in policy pronouncements that were impactful and those that were not. It could be seen from the results that monetary policy pronouncements were not always effective. However, despite this, monetary policy was still effective when it included directives that directly impacted bank operations. In this way, monetary policy effectiveness in the absence of a local currency required manipulation of bank operating regulations or the promise of legislative changes or impending legislative changes. In the absence of these, monetary policy changes by the central bank did not significantly influence stock market behaviour and potentially carried little impact on the economy as a whole.

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1 Introduction

Monetary Policy is one of the critical determinants of a country's economic growth and development. This is because it has the potential to promote or stifle government spending, local and foreign investment, domestic savings and socio-economic welfare. As such, it has necessarily attracted considerable research with scholars and practitioners seeking to improve the understanding of both the circumstances of when it works and the manner in which it works. However, as Mangwengwende et al. (2011) show, the research has largely focused on the study of monetary policy through the transmission mechanism of interest rates. The bias in approach is understandable when it is considered that most countries conduct their monetary policy through the interest rate mechanism where the central banks look to influence the lending and deposit rates of their local banks with the view to either increase or decrease the amount of money within the economy[2]. A problem thus arises for countries that do not use their own currency because the ability of the central bank to manipulate interest rates by functioning as a lender of last resort or trading securities is significantly limited. This means that the vast amount of research on the formulation and implementation of effective monetary policy is not applicable to these countries as the premise on which the research is built does not hold in them. Thus countries and territories such as Zimbabwe, El Salvador, East Timor, Ecuador, the British Virgin Islands and future countries contemplating abandoning their domestic currencies have a need to develop their own tools to improve monetary policy effectiveness[3].

It is with a view to improving monetary policy effectiveness that this study reviews monetary policy in Zimbabwe from 2009 to 2017. This is a period that follows the implementation of the country's multiple currency system that effectively made the United States dollar the *defacto* currency of the country[4]. By reviewing the effectiveness of past measures undertaken without a domestic currency, the study identifies elements that drive effective policy.

The significance of the work is not only in its ability to inform practitioners of the effectiveness of past monetary policy measures but to inform the development of future policy measures that have a significant impact on economic growth and development.

2 Literature Review

The literature on monetary policy effectiveness predominantly revolves around tools to enhance the interest rate channel of monetary policy, as noted above. However, this channel is necessarily limited or entirely unavailable to policy makers in countries that do not have their own currencies. As such this literature review does not focus on that traditional body of monetary policy research but, rather, presents literature addressing what constitutes effective monetary policy outside of references to traditional money creation mechanisms, namely, printing money or standing as a lender of last resort. This means that this literature review focuses only on the matter of what constitutes effective monetary policy without review of the large body of traditional research that carries limited applicability in the context of this study.

The purpose of monetary policy is to create an environment that enables economic growth and development (Gono, 2009; Mangudya, 2017). These aims are pursued through the use of directives, moral suasion and advice (Gono, 2009, 2010, 2011, 2012, 2013; Mangudya, 2014, 2016, 2017). To the end of creating the aforementioned enabling environment, monetary policy has sought to adjust the amount of money in the economy and the level of inflation as suggested by conventional monetary economic theory presented by Mishkin (1995).

However, while effective monetary policy is conventionally taken as policy that changes inflation and adjusts the amount of money in circulation it is possible to falsely attribute money supply and inflation changes to monetary policy when they are actually the result of other simultaneously occurring factors (cf. Mangwengwende et al. (2013) on the false attribution of stimuli). As such, while there is no debate on what monetary policy is and what it pursues, there is need to determine if it is actually responsible for changes occurring in the economy. This is because, as Mishkin (2009) notes, there lies a temptation to abandon monetary policy as ineffective in cases where economies are in crisis. This temptation stems from the inability to note the specific impact of the policy i.e. is the monetary policy simply convention with no consequence or is it actually contributing to the creation of the desired economic growth and development.

[1] The stock market was used a proxy of the Zimbabwean economy as itis a leading indicator of economic activity due to the fact that it reflects the sentiments of experienced financial professionals and investors who interpret and act on signals in the monetary policy when they deem them impactful.

[2] The author remains cognisant of the other tools of monetary policy, namely, open market operations and exchange rate policies, however, it is the issue of interest rates that has traditionally dominated the discourse on monetary policy.

[3] Countries taken from Chibber (2014).

[4] While the Zimbabwean dollar was not demonetised until 2015, the currency had effectively been abandoned by April 2009 when the multiple currency system was introduced due to hyperinflation.

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It is at the need to determine if monetary policy is actually having an impact on the economy that this study assesses the monetary policy in Zimbabwe from 2009 to 2017. If the policies are ineffectual then there needs to be a review of how they are developed, implemented and assessed and if they are sometimes effective, it is necessary to determine when they are and what makes them so.

3 Methods

This research has two fundamental questions to address. The first is whether monetary policy has been effective in Zimbabwe in the absence of a local currency and, secondly, can the effectiveness or lack thereof be explained by elements within the policies.

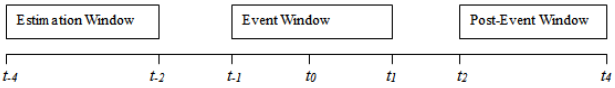
In order to address these questions the study conducts event studies that determine the response of a portfolio of the most liquid stocks on the Zimbabwean Stock Exchange to Monetary Policy Statements from 2009 to 2017. This is done by determining whether the policy statements result in abnormal returns on the portfolio. Where the portfolio returns are abnormal, the market is signalling a response to monetary policy and where the returns do not statistically depart from their normal levels, the market is signalling that the Monetary Policy Statement is of little consequence and business is continuing as normal.

The value of using stock market returns in event studies to determine the effectiveness of monetary policy lies in the fact that stock markets are fundamentally driven by financial and economic experts who are consistently adjusting their investment decisions in response to economic stimuli. In cases where the central bank announces monetary policy that is expected to significantly affect the operations of companies, it is the actions of these financial and economic experts that results in the purchasing or sale of shares in companies listed on the ZSE. Where the experts interpret the policy as inconsequential or of limited impact, their buying and selling decisions do not depart from their normal levels and the stock market does not reflect abnormal activities.

A key benefit of this approach is in the fact that stock markets are made up of individuals and companies that reflect their honest assessment of the information they receive. This is because most of the activities are driven by the incentive to make a profit and so they reflect the true evaluation of Monetary Policy without favour or bias. Regardless of political commentary and reviews of policies in newspapers, the ultimate reflection of whether the policy is considered effective or not can be seen in whether the market responds to it or not.

In order to identify whether the market has responded to a policy pronouncement through abnormal returns it is necessary to first determine what constitutes normal returns. To this end the study uses a traditional Market Model built on Mechi and Cheng's (2007) timeline which is illustrated below.

Figure 1: Estimation Window



Where the Monetary Policy announcement occurs at time t_0

The study uses a 90 day Estimation Window to determine the normal return on the portfolio and then a three day window is used for the event to capture the response to the policy announcement. The estimation window is sufficiently large enough to determine a normal return while the three day window ensures the market's response is fully captured[5].

The normal returns of the portfolio can be represented by the following equations:

$$E(R_{it}) = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (1a)$$

$$\varepsilon_{it} = E(R_{it}) - \alpha_i - \beta_i R_{mt} \quad (1b)$$

$$E(\varepsilon_{it}) = 0 \qquad var(\varepsilon_{it}) = \sigma^2_{\varepsilon_{it}}$$

In these equations $E(R_{it})$ is the return in period "t" on a portfolio "i", α_i is a constant, β_i is the beta of portfolio "i" returns relative to the market R_{mt} at time "t" and ε_{it} is the disturbance term with an expected value of zero and a variance $\sigma^2_{\varepsilon_{it}}$ determined over the estimation period.

The abnormal returns are then a function of subtracting the normal/expected return of the portfolio from the actual return of the portfolio as follows:

$$AR_{it} = \varepsilon_{it} = E(R_{it}) - \alpha_i - \beta_i R_{mt} \quad (2)$$

Where AR_{it} is the abnormal return of portfolio "i" in period "t".

It is important to note that as Figure 1 shows, the study uses a three-day window for the event. As such, it effectively

[5] It may be tempting to assume that the impact of monetary policy will carry over longer than the three day window, however, as illustrated by Malkiel's (2003) discussion of Fama's Efficient Markets Hypothesis, markets quickly respond to new information.

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uses an average of the cumulative abnormal return to represent the abnormal return following the announcement of the policy.

Following the determination of the returns over the event window and the estimation window, a comparison is made to determine if the event window statistically significantly departs from the estimation window. Statistically significant differences in returns (i.e. abnormal returns) provide evidence of the impact of the monetary policy. A lack of a statistically significant difference in returns suggests the policy did not compel economic agents to depart from their regular operations (i.e. no impact of monetary policy).

The statistical significance of the difference is determined by a parametric approach following Brown and Warner (1985, p. 10) where the *t-statistic* is computed from the following equation:

$$T = \sqrt{N}\frac{\overline{AR}}{\widetilde{S}(\overline{AR})} \approx N(0.1) \tag{3}$$

Where $\widetilde{S}(\overline{AR})$ is the standard deviation of the average cumulated abnormal returns ($\overline{AR}$) of the portfolio. This *t-statistic* is used to test the statistical significance of the difference between the normal and abnormal returns under the assumption that the returns are not statistically significantly different (i.e. the market has continued to act normally).

Common themes in the monetary policy that elicits a market response are then identified as potential triggers of effective monetary policy in the absence of a local currency.

4 Data

The study conducted 9 event studies around each of the monetary policy statements from 2009 to 2017. The portfolio consisted of the most liquid socks on the ZSE and counters from different industries, namely, Barclays, Econet, Delta, Innscor, Old Mutual, OK, SeedCo. And the Mining Index which were weighted according to their market capitalisation and the frequency of their trading. The portfolio reflected different industries to ensure that the market's response to Monetary Policy was captured.

The study avoids the use of the composite Zimbabwe Industrial Index as its movement is dragged down by infrequently traded stocks and so does not quickly reflect the impact of market shocks. Moreover, the portfolio's normal return computation requires an independent market return as seen in equations (1a) and (1b). It is also important to note that one of the advantages of using the stock exchange as a measure of monetary policy is that the limited availability of alternative investment options for Zimbabwean investors mean that decisions to enter/leave the market or grow/reduce exposure to the market have to constantly be made which means that ZSE participants are, particularly, sensitive to policy changes.

5 Results

The results of the calculation of normal returns were as follows:

Table 1: Normal Returns

Year	α	Prob.	β	Prob.	St. Dev.
2009	-1.24	0.90	0.52	0.00	1.69
2010	-0.35	0.68	0.25	0.01	2.65
2011	0.25	0.35	0.68	0.00	3.98
2012	-0.36	0.87	0.15	0.00	3.52
2013	1.45	0.68	0.88	0.00	5.98
2014	1.22	0.54	0.82	0.00	4.36
2015	1.46	0.88	0.02	0.00	5.37
2016	1.78	0.19	0.68	0.00	3.52
2017	1.49	0.13	0.87	0.00	4.23

- α *and* β *are as described in equations* (1a) *and* (1b)
- ***St. Dev.*** *is the standard deviation of the returns*

As can be seen from the above table, all the estimations of normal returns are statistically significant with probabilities below the 1% threshold for the βs. This means that not only does the simulated portfolio have a relationship with the entire market but that the estimations do capture a normal return for each of the announcements. This means that tests of abnormal returns can be performed for all nine years.

Following the computation of normal returns the results of the calculation of abnormal returns were as follows: (see Table 2).

The results of the *t-statistic* tests on the significance of the abnormal returns in Table 2 were as follows: (see Table 3).

As can be seen above, monetary policy resulted in statistically different returns on the portfolio in only three of the years under observation, namely, 2009, 2016 and 2017. This means that the monetary policy statements of 2010, 2011, 2013, 2014 and 2015 had little impact on the market. From an economic interpretation, the lack of impact can be attributed to the existence of phenomena beyond monetary policy that are considered to be more important

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Table 2: Abnormal Returns

Year		Abnormal Returns	Average cumulative abnormal return
2009	Day 1	0.57	0.71
	Day 2	0.67	
	Day 3	0.89	
2010	Day 1	0.25	0.20
	Day 2	0.33	
	Day 3	0.02	
2011	Day 1	0.76	0.75
	Day 2	0.86	
	Day 3	0.62	
2012	Day 1	0.09	0.13
	Day 2	0.15	
	Day 3	0.14	
2013	Day 1	0.24	0.94
	Day 2	1.35	
	Day 3	1.22	
2014	Day 1	−0.92	−0.86
	Day 2	−0.84	
	Day 3	−0.83	
2015	Day 1	−0.12	−0.06
	Day 2	0.05	
	Day 3	−0.1	
2016	Day 1	−3.25	−2.27
	Day 2	−2.2	
	Day 3	−1.37	
2017	Day 1	2.5	3.63
	Day 2	3.7	
	Day 3	4.7	

that the policy pronouncements. For example, a policy statement such as the one in 2014 that presented a dovish outlook was largely ignored by the market. In the years when responses were noted, the policy statements carry pronouncements that directly impact bank operations, for example, instructions on issuance of Bond Notes[6] and their management. Policy statements made in the absence of a local currency need to carry directives and prescriptions with implications for bank operations, statements that did not seek changes in bank operations do not carry the same impact.

It is tempting to argue that the lack of market response may simply be an endorsement of the *status quo* and affirmation

[6] Zimbabwe's quasi-currency with a stipulated equivalence to the United States dollar.

Table 3: T-statistics

Year	*t-statistic*
2009	3.985 593**
2010	0.715 987
2011	1.779 774
2012	0.341 382
2013	1.485 953
2014	−1.878 51
2015	−0.100 11
2016	−6.126 91 ***
2017	8.148 659***

*,**,*** denotes statistical significance at a 10%, 5% and 1% level based on the critical values from a standard normal distribution.

of a monetary policy that is promoting *"business as usual"*. However, that ignores the fundamental tenet of monetary policy that suggests that it should trigger a response more so when that policy statements themselves explicitly state a desire to trigger a market response, as is the case in this study.

6 Conclusion

As would be expected, in the absence of the use of a local currency monetary policy effectiveness is reduced with most policy announcements not statistically significantly changing the return on the portfolio. This provides empirical evidence on the limited impact of traditional monetary policy in Zimbabwe. However, monetary policy in 2009, 2016 and 2017 did have a statistically significant impact on the portfolio's returns suggesting that monetary policy can be effective even when a country does not have a local currency. However, such cases required pronouncements that directly impacted bank operations.

It should be noted that it is beyond the scope of this study to comment on the implications of monetary policy driven by directives that affect bank operations just that when the policies are impactful, directives are a part of the policy statement. It would require studies into the long term consequences of monetary policy driven in this manner to determine the merits and demerits of such an approach.

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