“THE EFFICACY OF MONETARY POLICY ON ECONOMIC GROWTH IN SWAZILAND”

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ABSTRACT

In this paper we have specified and estimated three equations linking monetary policy variables with economic growth to determine the efficacy of monetary policies on economic growth. In our view of the transmission mechanism, domestic interests are at the center of the analysis. The econometric model results indicated that real GDP is influenced by, amongst other variables, monetary variables such as domestic interest rate, exchange rate, credit extension and price differentials between Swaziland and South Africa. The study further finds that credit extension has temporary negative impact on real GDP but with positive long-run effects.

Domestic interest rates were found to be responding most on inflation which itself depends largely on external factors such as South African CPI and the exchange rate. Domestic factors such as wages and capacity utilization were found to be significant in explaining the variation in domestic inflation. The study also demonstrated that the inflation-induced monetary policy tightening has a temporary negative effect on growth in Swaziland and vise-versa. The main implied policy recommendation from the study therefore is that in order for monetary policy to translate into growth in the short to medium term policymakers should strive to maintain low inflation by designing policies that will address those factors responsible for inflation in Swaziland as identified in the equation for CPI.

Maintaining low inflation very close to that prevailing in South Africa should be the main target of policymakers which will not only ease monetary policy but also promote exports.
competitiveness in the South African markets and attract investments hence economic growth.
THE EFFICACY OF MONETARY POLICY ON ECONOMIC GROWTH IN SWAZILAND

1.0 INTRODUCTION

1.1 Review of Swaziland’s Membership in the Common Monetary Area
Monetary policy in Swaziland can not be viewed in isolation of the Common Monetary Area (CMA) for the basic reason that by her membership to the CMA Swaziland surrenders monetary policy to the South African monetary authorities.

The features of the CMA have evolved from the monetary union tightly based on the ZAR to a situation where the LNS have issued their own currencies, obtaining a certain degree of independence. Given the parity peg of the Lilangeni to the Rand and the free mobility of capital, Swaziland with a small economy compared to that of South Africa acts as a price taker of interest rates from South Africa and the inflation rates for the two countries move in tandem with that of Swaziland almost always above that of South Africa. Monetary policy in Swaziland under this configuration mirrors that of South Africa. The main feature that distinguishes the status quo to the status quo ante independence is that the small states can issue their own currency through the local monetary authority, which is formally responsible for monetary policy within the respective country.

The monetary transmission mechanism for Swaziland can therefore be viewed in the context of the CMA as it originates from South Africa. Even though the CMA is a formal arrangement, monetary policy decisions in South Africa does not take into account economic fundamentals in
Swaziland. Inflation rate is targeted de facto given the direct transmission of inflation from South Africa on the back of a currency pegged at par with the Rand, as well as dependency on imports from South Africa averaging 85 percent in the period under review. South Africa started targeting inflation in 2000, hence Swaziland de facto begun inflation targeting. There are as a result two policy regimes, namely pre-inflation targeting and inflation targeting regimes (after 2000). The difference in the two policy regimes is that before inflation targeting “informal inflation targeting” was already applied by the South African Reserve Bank. Considerable emphasis was placed on the attainment of price stability, but the time period over which this would be achieved was not specified. At first the framework also differed from formal inflation targeting because an intermediate target, the growth in money supply, anchored monetary policy decisions. Later, towards the end of the 1990s, the Reserve Bank moved to “eclectic” or “pragmatic” inflation targeting. In this framework, developments in the monetary aggregates were still regarded as vital elements in the inflation process, but the Bank closely monitored developments in other financial and real indicators in reaching a decision on the appropriate level of short-term interest rates.

1.2 Inflation, Growth Trends and Monetary Policy in Swaziland

The Central Bank of Swaziland has as its ultimate goal inflation management to create an environment conducive to economic growth. The monetary authorities in the country basically use the discount rate to control inflation but subservient to the movements in the discount rate in South Africa. The graph below shows the time series data for the discount rate and inflation from 1980 to 2006. There is a prima facie relationship between the two variables and the paper seeks to establish whether there is correlation and if there is, how strong.
Besides controlling inflation by discouraging borrowing through higher interest, imported component of inflation is curbed by a strong Rand on the back of higher interest rates. Swaziland is also affected by South Africa’s imported inflation through imports from South Africa. A stronger Rand therefore means lower imported inflation by Swaziland via South Africa.

Given that inflation targeting started in February 2000 in South Africa where the targeted inflation is the consumer price index excluding mortgages (CPIX) the period under review can therefore be separated into two policy regimes which are pre inflation targeting and inflation targeting period as noted earlier.

The pre-inflation targeting policy regime period was characterized by targeting intermediate monetary aggregates like money supply growth to anchor inflation. Importance was given to price stability but the time in which price stability would be attained was not defined. In the early
eighties inflation peaked to above twenty percent and the discount rate tracked behind. The monetary authorities reacted by increasing the discount rate in an attempt to contain inflation. As the discount rate increased, inflation responded by falling and the monetary authorities attained an allowance to reduce inflation. Inflation was again on an upward trend towards the nineties and again there was an increase in the discount rate. The pre-inflation targeting policy regime period is characterized by prima facie tenuous relationship between the discount rate and inflation because of the nature of monetary policy followed during the era. There are for instance instances where inflation was above the discount rate suggesting that the monetary authorities focus was on money supply growth which later translate into inflation. In such a policy regime there is chance of missing the control of inflation by focusing on intermediate monetary aggregates. The inflation targeting policy regime which entails directly focusing on inflation gives a clearer relationship between the discount rate and inflation. The discount rate has always been above inflation and the discount rate under this policy regime reacts to changes in inflation in the context of the established inflation target range of 3 to 6 percent.

The GDP growth rate slumped in the early eighties recovering towards the mid eighties to reach a peak of 15 percent in 1987. The high economic growth rates experienced in the eighties resulted from the fact that Swaziland was used as a conduit to the international market by South African firms. As economic growth peaked in the eighties monetary policy tightened. The discount rate was moving in tandem with the expansion in credit as monetary policy changes were mostly dictated by money supply growth given the nature of monetary policy then.
The nineties have been characterized by low economic growth as companies re-located to South Africa because of the democratization process. In the nineties credit growth showed no clear direction but was on average on the increase resulting in tight monetary policy. The tight monetary policy lead to shrinking profits as the cost of capital rose and in the process compromised growth. In the years 2003, 2004 and 2005 interest rates were at their lowest but growth remained elusive at 2 percent. As the cost of capital fell investment did not materialize by both debt and equity financing.

The nineties thus were practically characterized by a mild stagflation worsening in 2001 and 2002 as growth remained as low as 2 percent and inflation hovered at 11 percent. Stagflation has resurfaced recently as growth has remained low and inflation spiraled out of the bounds of the de facto target range of 3 to 6 percent and approaching the projected average inflation rate for 2007 of 8.3 percent.
If the impact of the discount rate on economic growth is viewed in isolation of the interest rate differential the aspect of other countries competing for financial resources and the impact on economic growth escapes the analysis. The graph below shows the time series data for discount rate differential between Swaziland and South Africa and the capital account-net other investment balance.

Throughout the period under review the discount rate differential has been generally below zero implying that Swaziland’s discount rate has been mostly lower than that of South Africa. In the period of high growth, the 1980’s, the discount rate differential was generally below zero suggesting that financial resources were diverted to South Africa due to higher interest rates and compromising economic growth in Swaziland. But to the contrary, Swaziland experienced high economic growth rates which were influenced by the political establishment in South Africa. In the early 1990’s when the democratic process unfolded in South Africa
and the huge discount rate differentials, capital flight resulted, compromising economic growth in Swaziland.

There is a prima facie relationship between outflows and discount rate differentials which would capture effects of the discount rate differential on economic growth. The discount rate and discount rate differential have different paths through which they affect growth. The discount rate differentials affect growth by movements in financial resources to where interest rates are higher and the discount rate encourages and discourages growth through the ability to borrow.

The capital account balance has been positive from 1986 up until it fell to below zero in 1996. This happened despite that Swaziland had lower interest rates than South Africa. Other factors other than interest rate differential influenced the direction of capital flows. Before 1994 South Africa was under international political and economic sanctions hence capital flows favored Swaziland despite the lower interest rates. As South Africa started her democratization process investor sentiments shifted in favor of South Africa. After the election in 1994 Swaziland started experiencing huge capital outflows to South Africa experiencing the worst outflows in 2002. As interest rates between South Africa and Swaziland equalized the capital account reverted to a healthier position. As the Government came under financial pressure treasury bills were floated mopping up the liquidity which would have otherwise been invested in South Africa and improving the position of the capital account.

The discount rate and interest rate differential affect economic growth by discouraging borrowing and capital outflows/inflows respectively. As the discount rate is used to control inflation by discouraging borrowing there is also the exchange rate channel through which imported inflation
enters the economy. When the discount rate rises to close or widen the interest rate differential hot money is attracted into the economy and in the process the Lilangeni/Rand strengthens cushioning imported inflation but compromising growth as exports become less competitive.

Volatility in the exchange rate has varying economic ramifications. The first of these is the negative impact exchange rate volatility has on confidence as it makes investment planning and decision difficult. Swaziland is a small open economy and its economic growth is export led. Maintaining high economic growth over a long period of time requires maintaining an appropriately competitive and sustainable exchange rate, which is not possible for Swaziland because of the parity status of the domestic currency with the rand. On the face of it, exporters are clear gainers when depreciation of a currency occurs as it enhances the competitiveness of the country’s exports in world markets, whilst discouraging imports in the local market. Consequently this can lead to improvement in the trade balance of the country. However, this
improvement depends also on responses to price changes, that is, on the price elasticities of demand for exports and imports respectively. For a small country like Swaziland whose well-being is closely tied to export performance, the economic significance of the domestic currency stems from its ability to influence export performance above everything else.

The Lilangeni/Rand has been depreciating throughout the period under review save for the period after 2000 and the GDP growth rate was moving in tandem with the movements in the exchange rate. The GDP growth rate picks up with depreciation as exports become more competitive. In 1985 the exchange rate depreciated by a whopping 49 percent and high growth rates lagged. There is apparently a lagged response in growth to depreciation in the exchange rate suggesting the period it takes for companies to respond to the depreciation. In 2001 the Lilangeni/Rand took a dive but GDP growth response was weak. The weak response of GDP growth to depreciation suggests that there are instances where monetary policy through the exchange rate channel is less effective. The paper will establish in what settings monetary policy is effective and when it is not.

However given that a bulk of Swaziland’s exports (over 50 percent) are destined to South Africa coupled with the parity between the two countries’ currency, the better part of the variation in GDP growth emanating from exports could be best explained by price differentials between the two countries. Figure 4 indicate an upward trend in inflation rate differentials in the 80,s suggesting that domestic inflation rate was increasing at a slower pace than that prevailing in SA. However, beginning in 1992 the trend was downward sloping implying that domestic inflation outpaced SA inflation.
Trends in GDP growth are also in tandem with the movements in inflation differentials confirming that during high domestic inflation rates compared to those prevailing in South Africa Swaziland’s exports competitiveness in South African markets are compromised hence low economic growth and vice-visa.

The rest of the paper is structured as follows. Section 2 of the paper gives an overview of literature on channels of monetary policy transmission to determine the potential effects of changes in monetary policy aggregates on economic growth. Section 3 gives an overview of the data used in the study, whilst the estimation methodology is discussed in section 4. In section 5 the estimation results is presented, followed by conclusions and policy implications in the final section of the paper.
2.0 Literature Review

2.1 Monetary Policy and Economic Growth

This section presents a brief overview of monetary policy transmission theories on economic growth and empirical evidence regarding the linkages between monetary policy variables and economic growth in different countries.

Theories on monetary policy channels on growth put emphasis on a number of channels among which are interest, credit, exchange rate and other assets price channels. The study will focus mainly on the first three in view of the fact that Swaziland’s stock market is under-developed. The so-called interest rate channel is traditionally the most applied, which also usually coincides with Keynes IS/LM framework such that expansionary monetary policy would stimulate aggregate demand by increasing the demand for interest bearing assets thus lowering the interest structure of the economy, under a rediscount rate to present value using a constant rate of return on the future values of these assets (Aslan and Korap: 2007).

According to this traditional channel, a policy-induced increase in the short-term nominal interest rate leads first to an increase in longer-term nominal interest rates as investors act to arbitrage away differences in risk adjusted expected returns on debt instruments of various maturities as described by the expectations hypothesis of the term structure. When nominal prices are slow to adjust, these movements in nominal interest rates translate into movements in real interest rates as well. Firms, finding that their real cost of borrowing over horizons has increased, cut back on their expenditures. Likewise, households facing higher real borrowing costs scale back on their purchases of homes, automobiles and other durable goods (Ireland, 2005).
The traditional interest rate channel works in many ways and there are several links in the chain of causation running from monetary policy to their ultimate effects on the economy. This theory is said to be reliable only if two premises are satisfied. First, the central bank should have influences over the short and long term real interest rate. This is the case when there is slow responsiveness of inflation in the economy, which could come from the presence of nominal rigidities such as sticky prices. Secondly, the components of aggregate demand should be interest sensitive (Juks, 2003).

Austria is a country where interest sensitive components of GDP seem to account for a large part of the movements of GDP due to monetary policy (Angeloni et al., 2002). While this indicates a strong interest rate channel, firm panel results show that liquidity, not user cost of capital, is the most important determinant of investment. The latter rules out the dominant role of the interest rate channel in Austria. As the existence of strong bank networks, firm bank relationships and trade credit suggests a weak lending channel, it can be concluded that monetary policy effects beyond the interest rate channel should work largely through the other channels.

Another possible transmission on economic growth works through the credit channel. The view of credit channel mainly emphasizes the role of bank credits in transmitting the effects of monetary policy onto the real economy. There are two distinct credit channels described by literature, the bank-lending channel (narrow credit) and the balance sheet channel (broad credit), which allow the effects of monetary policy actions through the real economy.
The bank-lending channel is based on the view that banks play a special role in the financial system on the assumption that they are well suited to solve information asymmetry problem in credit markets. For the bank-lending channel to exist a reduction in reserves engineered by the monetary authority must cause the volume of bank lending to decline, that is, banks must not insulate their loan supply after a shock to reserves by simply rearranging their portfolio of their assets and liabilities. Furthermore, a bank-lending channel requires that some firms cannot costless replace losses of bank credit with other types of finance, but rather must curtail their investment spending. The significance of the bank-lending channel depends on two factors. First, the number of bank-dependent borrowers and secondly, the quantitative impact of monetary policy on the supply of bank loans (Juks, 2003).

The central bank can affect the supply of bank loans in two ways. First by raising the reserve requirement, this has the ultimate effect of reducing not only the total volume of commercial bank assets but also the proportion of commercial bank earning assets to their total assets. The second way is by conducting open market sales. An open market of treasury bills will reduce commercial bank reserves as purchasers issue cheques against their accounts in commercial banks (Uanguta and Ikhide, 2001). When the central bank engages in open market operations (stimulating financial sector activity through purchases), it pays for the securities by crediting the reserve accounts of the appropriate commercial banks. The commercial banks then have additional reserves that they can invest in other assets. To foster such investment by commercial banks, interest rates have to be reduced (Humpage, 1996; Blei, 2004). According to the fundamental view, this interest rate reduction then encourages an expansion of interest rate sensitive spending such as business fixed investment. Such an activity is viewed
as a necessary catalyst of growth and shows, to a certain extent, the efficient use of funds towards productive intentions.

A distinctive feature of the bank-lending channel is the ability of a tight monetary policy to cause a fall in supply of loans beyond what will ordinarily be predicted by a rising interest rate. A rise in interest rate resulting from tight monetary policy will cause a fall in private investment due to a higher cost of capital and reduction in bank loans supply mostly to small and medium scale entrepreneurs who are rationed out of credit market as a result.

Exchange rate effects, which changes relative prices of domestic and foreign goods, influencing net exports and also the value of foreign currency dominated assets with resulting balance sheet effects, are also a way of transmitting monetary policy into an economy. This channel operates in open economies, where additional real effects of a policy-induced increase in the short-term interest rate come about. When the domestic nominal interest rate rises above its foreign counterpart, equilibrium in the foreign exchange market requires that the domestic currency gradually appreciates at a rate that serves to equate the risk-adjusted returns on various debt instruments. In this case the appreciation of the domestic currency, that is, when prices are slow to adjust, makes domestically produced goods more expensive than foreign-produced goods. Net exports fall, domestic output and employment fall as well (Ireland, 2005).

2.2 Monetary Policy and Inflation
The objectives of monetary policy in many countries are usually related to money and credit control, price stabilization and economic growth. Many consider price stability as the most important objective of
monetary policies since monetary policies are considered more effective than fiscal policies in dealing with inflation. That is, monetary policy plays a key role in determining inflation rates. With respect to economic growth there are many convincing evidences that price stability is regarded as a prerequisite for sustainable output growth. High inflation discourages savings and foreign investment which form part of the factors responsible for economic growth.

It is therefore acceptable world-wide that the main objective of central banks is to ensure price stability. A variety of monetary policy frameworks are consistent with achieving this objective, although there has been a shift over recent years to forms of inflation targeting. Even in countries without an explicit inflation target, there is often a strong commitment to an implicit medium-term inflation objective. Further, countries that have chosen to fix their exchange rate have typically done so against a country with some form of implicit or explicit inflation objective. Another form of monetary policy system is based on monetary aggregates, which has an implicit target of inflation in the allowable growth rate of money supply. Fixed exchange rate systems are often used by countries to achieve a similar inflation rate as that applying in the country against which they are fixing. Finally, in systems in which the central bank uses some form of Taylor rule to guide the setting of short-term interest rates there is a specific inflation target which the central bank expects to achieve on average (Reserve Bank of Australia Bulletin 1997).

Whilst the move to inflation targets has made the ultimate goal of monetary policy more transparent, it has not meant that central banks have eschewed all attempts to mitigate cyclical fluctuations in output and employment. There is need for central banks to ensure that sustainable output and employment growth is achieved. The extent to
which monetary policy influences output depend upon the structure of the economy, the type of shocks that occur, the nature of the financial system and the public’s perception of monetary policy.

In examining the effects of monetary policy on output growth it is imperative to distinguish between the short-term and long-term effects. Theory and evidence support the view that it is possible for monetary policy to influence aggregate economic activity in the short and medium term but cannot be expected to directly contribute to raising long-term economic growth. The short-run connection between monetary expansions and real economic growth capitalizes on imperfections in the public’s information about prices (Humpage 1996). However, monetary policy can foster sustainable growth by maintaining an environment of price stability.

2.3. Trade-Off between Economic Growth and Inflation

While the consensus among economists is that there is no long-run trade-off between the levels of output and inflation, most accept there is a short-run trade-off. The consequence is that there is a long-run trade-off between the volatility of output and the volatility of inflation. If central banks wish to keep inflation within a narrow range by hiking interest rates, it is likely that this will come at the cost of larger fluctuations in output. A study on seven countries namely New Zealand, Canada, UK, Finland, Sweden, Australia, and Spain indicated that although inflation in these countries has fallen, it has been accompanied in most of them by higher unemployment (IMF, 1998).

The acknowledgement of a short-run trade-off between inflation and economic growth has probably contributed to the application of inflation targeting in a flexible rather than strict manner. Strict inflation targeting is applied where the central bank attempts to reach the long-term
inflation objective as quickly as possible, while central banks following a flexible approach will attempt to reduce inflation gradually to the desired long-term level taking the effect of its actions on other economic variables into consideration (E J van der Merwe, 2004).

Some economists proposed rules in terms of the main objectives of monetary policy, for example, “maintain economic stability” or “maintain a constant aggregate price level”. Stanford economist John Taylor (1993) proposed a rule designed to provide "recommendations" for how a central bank like the Federal Reserve Bank should set short-term interest rates as economic conditions change to achieve both its short-run goal for stabilizing the economy and its long-run goal for inflation.

Specifically, the rule states that the "real" short-term interest rate (that is, the interest rate adjusted for inflation) should be determined according to three factors: (1) where actual inflation is relative to the targeted level that the Fed wishes to achieve, (2) how far economic activity is above or below its "full employment" level, and (3) what the level of the short-term interest rate is that would be consistent with full employment. The rule "recommends" a relatively high interest rate (that is, a "tight" monetary policy) when inflation is above its target or when the economy is above its full employment level, and a relatively low interest rate ("easy" monetary policy) in the opposite situations. Sometimes these goals are in conflict: for example, inflation may be above its target when the economy is below full employment. In such situations, the rule provides guidance to policy makers on how to balance these competing considerations in setting an appropriate level for the interest rate. (Federal Reserve Bank of San Francisco 2006)
3.0 DATA PROPERTIES

The study is based on annual time series data beginning from 1980 to 2006. The econometric implication of the models specified in section four require time series data on the following variables: Real GDP (RGDP), Discount rate (DR), Consumer price index for Swaziland (CPISW), Consumer Price Index for South Africa (CPISA), Real credit extension to the private sector (RDC), Lilangeni exchange rate to US dollar (D_NER) defined as the number of domestic currency per US dollar, Potential real GDP (PRGDP), Consumer Price Index Differential between Swaziland and South Africa (CIPR) defined as the ratio of Swaziland CPI to South African CPI, Average wage per worker (W) and Capacity utilization (CU) defined as the ratio of real GDP to potential real GDP. Potential real GDP was generated by performing Hodrick-Prescott filter on real GDP.

Data problems such as unavailability and unreliability are the biggest obstacle for econometric research in Swaziland. As in other less developed countries, most of the series are very short and contain many structural breaks which make it hard to apply advanced statistical techniques.

Time series data tend to exhibit a stochastic or deterministic trend with the mean, variance and covariance changing over time, and thereby rendering the series non-stationary. The consequence of working with non-stationary data series in the estimation process is that this may yield a meaningless or spurious result, that is, there is danger of obtaining apparently significant regression results from unrelated data. The first step is thus testing for stationarity for each individual data series before estimating the equations. The null hypothesis of non-stationarity of the variables is tested against the alternative hypothesis of
stationarity using the augmented Dickey-Fuller (ADF)-(Dickey-Fuller (1979)).

Testing for stationarity on each of the above listed variables indicated that all the variables are non-stationary of order one i.e. I(1) save for CPI Swaziland and South Africa which were found to be I(2) respectively.

**4.0 METHODOLOGY**

**4.1 Specification of the equations**

From the foregoing sections on introduction (Review of monetary and economic developments in the country) and the literature review, it can be deduced that the possible channels through which monetary policy in Swaziland can influence domestic economic growth are as follows: interest rate i.e. the discount rate (DR), credit to the private sector (DC) and exchange rate (D_NER). However given the parity between the Lilangeni and SA rand and that a bulk of exports is destined to South Africa, the exchange rate may underestimate the influence of exports on economic growth resulting from the change in exchange rate. To capture the full extent to which exports will impact on growth, a relative price between Swaziland and South (CPIR) is added as an explanatory variable in the equation for real GDP. Consequently the equation for real GDP can be expressed algebraically as follows:

\[
\log(RGDP) = \alpha_0 + \alpha_1 \log(RDC) + \alpha_2 \log(D_{\text{NER}}) + \alpha_3 \log(DR) + \alpha_4 \log(CPIR) + \mu
\]

(4.1.1)

The variables are as previously explained. \(a_0, a_1...a_4\) are coefficients which can be interpreted as elasticities given that the equation is in logarithm (log) form. \(\mu\) is the error term.
The equation above does not explicitly address the issue of inflation developments which detects the direction monetary policy should take by the central bank. It is therefore imperative to understand the causes of domestic inflation in our quest to find out if monetary policies translate or not to economic growth in Swaziland. Previous studies on the causes of inflation in Swaziland have identified the following variables as the cause of inflation namely; CPI South Africa (CPISA) which capture the imported component of inflation from South Africa given the two countries economic integration, exchange rate (D_NER), average wage per worker (W) and capacity utilization or output gap (CU) as defined in the data properties section. The inflation equation therefore can be written mathematically as below:

\[
\log(CPISW) = \beta_0 + \beta_1 \log(CPISA) + \beta_2 \log(D_{NER}) + \beta_3 \log(CU) + \beta_4 \log(W) + \varepsilon
\]

Where the variables in brackets are as explained above. \( \beta_0, \beta_1, \ldots, \beta_4 \) are elasticities and \( \varepsilon \) is the error term.

Another equation is necessary to establish the linkage between the interest rate and the targets of monetary policy such as inflation, thus endogenizing monetary policy in the model. This equation resembles more or less the Taylor-rule equation which links monetary policy to two targets of economic policy: deviations of real GDP from potential real GDP, and deviations of the rate of inflation from the target rate of inflation. However given that inflation target may be unobservable, like in the case of Swaziland, Taylor suggested an equation with an intercept which can serve as a proxy. Given also the less developed financial markets in Swaziland and Swaziland’s membership in the CMA domestic interest rates are also influenced by South African interest rates.
Therefore the South African repo rate (SA_REPO) has been included as an explanatory variable in the equation for the discount rate. The domestic discount rate equation can be expressed as below:

\[
\log(DR) = \lambda_0 + \lambda_1 \log(CPISW) + \lambda_2 \log(RGDP) + \lambda_3 \log(SA\_REPO) + \eta
\]

The coefficients \(\lambda_1\) and \(\lambda_2\) capture the different relative weights the policymaker attaches to these two variables.

All the equations are estimated using Eviews software. A model linking all the above equations is created in EViews in order to carry out policy simulations (impulse responses) by shocking some of the exogenous variables (monetary policy variables) in the model one at a time and track their impact on the endogenous variables particularly on the real GDP.

### 4.2 Cointegration and Error Correction Model (ECM)

If non-stationary time series are used in regression models there is a need to test further for cointegration amongst the series. Testing whether two or more variables (which have been generated by I(1) time series processes) are cointegrated an Engle and Granger (1987) two-step procedure is widely used. Johansen (1988) also proposed a general framework for testing cointegration\(^2\). The Engle and Granger test for cointegration is often referred to as the residual based test which the study uses based on the assumption that there is only one cointegrating vector in the equations. The presence of a cointegrating relationship allows us not only to estimate the long-run relationship but also to further analyze the short-run dynamics and how adjustment to equilibrium is achieved. Therefore according to the Granger

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\(^2\)The Johansen test is preferred when there are more than two time series variables involved because it can determine the number of cointegrating vectors
representation theorem, the existence of a stable long-run relationship between the variables enables us to estimate an ECM.

Error correction models are based on the behavioral assumption that two or more time series exhibit an equilibrium relationship that determines both short- and long-run behavior. ECMs are useful as they reconcile the short- and long-run behavior of the variables by shedding light on the speed or rate of adjustment towards long-run stable equilibrium. Two different econometric methodologies can be used in the construction of the ECM namely the generalized one-step procedure\(^3\), and Engle and Granger two-step procedure.

Due to the unavailability of high frequency data or data beginning way back in the 1960’s which propelled us to work with a small sample, the study uses the residual based test for cointegration and the Engle and Granger two-step procedure for the ECM. Further to testing for cointegration in the estimated equations, several diagnostic tests will be performed to establish the robustness of the estimation results.

Testing for stationarity on the residuals or error terms of the three equations which is tantamount to testing for cointegration has indicated that the residuals are stationary suggesting the presence of cointegration in the equations. This therefore confirms the existence of a true relationship amongst the variables in the equations. Likewise the diagnostic test statistics revealed that all equations performed

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\(^3\)The one-step error correction model, which was popularized by Davidson et al. (1978), is a transformation of an autoregressive distributed lag (ADL) model (Banerjee et al. 1993). Unlike the Engle and Granger Two-Step Method where the error term incorporated in the ECM is derived from a long-run equation, the one-step method estimate the error correction coefficient directly from a single equation containing both long- and short-run variables, rather than deriving it from alternative specifications (Suzanna De Boef 2000)
satisfactory, as there is no indication of residual autocorrelation; and the normality and homoscedasticity of the residuals are clearly accepted.

5. **Empirical Results**

5.1 Estimation Results

**Long-run Equation for Real GDP**

\[
\begin{align*}
\text{LOG(RGDP)} &= -0.104 \times \text{LOG(DR)} + 0.402 \times \text{LOG(D\_NER)} + 0.758 \times \text{LOG(CPIR)} + 0.275 \times \text{LOG(RDC)} + 4.877 \\
&\quad \text{(16.677)} \\
&\quad \text{(4.579)} \\
&\quad \text{(5.555)} \\
&\quad \text{(12.972)} \\
\end{align*}
\]

Adj. R\(^2\) = 0.97 \quad \text{S.E.} = 0.06

**Short-run Equation for Real GDP**

\[
\begin{align*}
\text{DLOG(RGDP)} &= -0.163 \times \text{RESID\_RGDP(-1)} + 0.022 + 0.432 \times \text{DLOG(CPIR)} + 0.606 \times \text{DLOG(RGDP(-1))} - 0.143 \times \text{DLOG(RDC(-1))} \\
&\quad \text{(3.585)} \\
&\quad \text{(4.506)} \\
&\quad \text{(-3.733)} \\
\end{align*}
\]

Adj. R\(^2\) = 0.61 \quad \text{S.E.} = 0.02

Note: The numbers in brackets represent t-Statistics

The coefficients of the long-run equation are in line with theoretical expectations in respect to their signs and are also generally highly significant except for the discount rate which is significant at 10 percent level of significance. With a high adjusted R\(^2\) of 0.97 and a low Standard Error (S.E.) of regression of 0.06, within the sample, the explanatory variables explain real GDP variation precisely in the long-run. The magnitude of the coefficients indicates that price differentials between Swaziland and South Africa (0.758) compared to the other coefficients,
significantly influence the variation in real GDP through its impact on export competitiveness with respect to South African markets. The exchange rate also has the second largest coefficients of (0.402). These implies that Swaziland’s economy is very sensitive to exchange rate and price differentials which is in line with the hypothetical view that domestic economy relies heavily on export for growth. The interest channel to growth indicates that a 1 percent increase in discount rate will reduce real GDP by 0.1 percent suggesting that real GDP is less sensitive to the discount rate in the long-run. Meanwhile, credit extension has a positive influence on real GDP such that a 1 percent increase in credit extension will increase real GDP by 0.3 percent.

The short-run equation indicates a speed of adjustment towards equilibrium of 0.16. One notable result from the short-run equation is the negative effect credit extension has on real GDP. This is in line with Figure 2 in section one where it was observed that whilst on average real GDP and credit extension trend upwards together, in the short-run higher credit are associated with tight monetary policy which lead to shrinking profits as the cost of capital rose and in the process compromised growth.

**Long-run Equation for CPI Swaziland**

\[
\begin{align*}
\text{LN\_CPISW} &= 0.472\times\text{LN\_CPISA} + 0.172\times\text{LN\_D\_NER} + \\
& \quad 0.390\times\text{LN\_W} + 0.342\times\text{LN\_CU} + 0.301
\end{align*}
\]

\[
\begin{pmatrix}
(7.493) \\
(4.350) \\
(5.304) \\
(2.927) \\
(2.793)
\end{pmatrix}
\]

\[
\text{Adj.R}^2 = 0.999 \quad \text{S.E. 0.03}
\]
Short-run Equation for CPI Swaziland

\[ D(LN\_CPISW) = -0.861^{\star}\text{RESID\_CPISW(-1)} + 0.464^{\star}D(LN\_CU) + 0.522^{\star}D(LN\_CPISA) + \\
0.156^{\star}D(LN\_D\_NER) + 0.039 \\
\text{(4.193)} \quad (4.067) \quad (4.620) \quad (4.286) \quad (3.186) \]

\[ \text{Adj.R}^2 = 0.657 \quad \text{S.E.} = 0.02 \]

Both the coefficients of the long and short-run equations for Consumer Price Index (CPI) are highly significant with the right expected signs. The high adjusted \( R^2 \) of 0.999 of the long-run equation implies that the equation is well specified with almost 100 percent of the variation in CPI being explained by the right hand side variables. The impact of CPI South Africa on domestic CPI which captures the imported component is high at 0.47 implying that a 1 percent increase in CPI South Africa will increase domestic prices by 0.47 percent. Wages also plays a major role in the variation of prices in Swaziland whose coefficient is 0.39. Price variation is also attributable to exchange rate movements (0.17) and capacity utilization (0.30).

Equation for Discount Rate

\[ \text{LOG(DR)} = 0.525^{\star}\text{LOG(CPISW)} - 1.108^{\star}\text{LOG(RGDP)} + \\
0.826^{\star}\text{LOG(SA\_REPO)} + 5.882 + [\text{AR(1)=0.283}] \\
\text{(2.247)} \quad (2.309) \quad (8.823) \quad (2.557) \quad (1.269) \]

\[ \text{Adj.R}^2 = 0.85 \quad \text{S.E.} = 0.1 \]

The discount rate equation does confirm the relationship between domestic inflation, economic activity, South African repo rate and domestic discount rate. The coefficients are highly significant bearing the expected signs. The positive sign for CPI and the negative sign for real GDP is an indication of a trade-off between the two variables, that is, if
the central bank pursues a tight monetary policy by increasing the discount rate in an endeavor to cushion inflationary pressure this will be achieved at an expense of lower real GDP growth and vise-versa.

5.2 In-Sample Simulation Results

In the above forgoing analysis the focus was on individual equation i.e. analyzing each equation in isolation of the other equations. A model has been created to establish the linkages between the three equations in order to carry out policy simulations by shocking one of the exogenous variables (those variables not determined in the model) and track their impacts on the endogenous variables particularly on real GDP. This section therefore analysis the simulation results emanating from such shocks.

A 1% Shock on Exchange Rate

![Impulse response of Real GDP to a 1% increase in Exchange Rate](image)

The above graph depicts the overall impact on real GDP resulting from a 1 percent increase in the exchange rate (depreciation). Initially, the 1 percent increase in exchange rate will directly and positively affect both the real GDP and inflation respectively (see Graph 5 of Appendix for the
direct impact of exchange rate on CPI). However the resulted increase in inflation will trigger a tight monetary policy (i.e. a hike in interest rate to control the resultant high inflation) and therefore cushioning the positive effect from the depreciation on real GDP. Further more the increase in inflation implies a widening of the inflation differential between Swaziland and South Africa hence undermining competitiveness for exports destined to the South African markets and consequently real GDP declines in the short-run as seen in the graph. However, as inflationary pressures normalizes in the long-run interest rate begins falling (see Graph 5 in Appendix) and price differentials improves in favor of Swaziland’s exports to South African markets thus real GDP start picking up until it reaches a new long-run equilibrium after approximately 10 to 12 years.

**A 1% Shock on Credit Extension**

![Impulse response of Real GDP to a 1% increase in Real Credit Extension](image)

In tandem with the estimation results where it was discovered that credit extension has a negative short-run effect on real GDP, the simulation results from the model also confirms that. The immediate effect of an increase in credit extension will be to increase money supply hence
demand for goods and services. However given the slow response of GDP supply to the credit this will lead to excess demand (captured by capacity utilization in the equation for CPI) hence higher inflation. Therefore monetary policy will respond by hiking interest rate (see Graph 4 of Appendix for the impact of credit to the discount rate) thus compromising economic growth. Excessive demand for credit by individuals and the private sector has been blamed for the hike in inflation in Swaziland leading to a restrictive monetary policy. The inflationary aspect of credit extension could be explained by the possibility that credit is misdirected to consumption in Swaziland by individuals as opposed to investment. However in the long-run as supply begins responding to credit coupled with an expansionary monetary policy real GDP increases until it reaches a new long-run equilibrium after approximately the same years as in the exchange rate shock.

An exchange rate and credit extension induced monetary policy as shown by Graph 1 and 2 of Appendix respectively will in the short-run reduce real GDP and consequently increases it as monetary policy eases in the long-run.

A 1% Shock on Wages

![Impulse response of Real GDP to a 1% increase in Wages](image)
The above graph depicting the response of real GDP to a 1 percent hike in wages indicate a negative short and long-run impact of wages to real GDP before a new long-run equilibrium is reached after approximately 6 to 8 years. An increase in wages that are not proportional to productivity will be inflationary thus putting pressure on the Central bank to hike interest rate hence a decline in real GDP. The wage-induced monetary policy presented in Graph 3 of Appendix indicates a negative impact between itself and real GDP. The direct positive impact of the increase in wages on CPI and consequently on discount rate are depicted in Graph 6 of Appendix.

6.0 CONCLUSIONS AND POLICY IMPLICATIONS

6.1 Conclusions

In its objective to investigate whether monetary policy transmission through the three channels namely; interest rate, exchange rate and credit extension translate into economic growth in Swaziland, the following conclusions can be drawn from the econometric results of the study:

- Firstly, real GDP growth is influenced by, among other variables, monetary variables such as interest rate, exchange rate, credit extension and price differentials between Swaziland and South Africa. The study further concluded that credit extension i.e. the bank lending channel of monetary policy has temporary negative effect on real GDP with positive effect on real GDP in the long-run.

- Secondly, monetary policy (discount rate) in Swaziland, though limited, respond largely to domestic price developments and South African repo rate and less on economic growth. The recent tightening of monetary policy in Swaziland for example has been in response to inflationary pressures propelled by high oil and food prices whilst the economy warranted monetary easing for
high growth to be achieved. The study also demonstrated that the inflation-induced monetary policy tightening has a temporary negative effect on growth in Swaziland and vise-versa.

Thirdly, inflation in Swaziland which detects the direction monetary policy should take hence economic growth is largely influenced by developments in South African inflation which the country has no control over given the two country’s economies integration. Other factors influencing domestic inflation are the exchange rate also not in the country’s control due to the one-to-one peg of the domestic currency with the SA rand; wages and capacity utilization or output gap.

Fourthly, by shocking (increasing) the exchange rate and wages respectively in the model the direct effect of the exchange rate will be on both inflation and real GDP which in the short-run will translate into high interest rates and in the process lowering economic growth. However in the long-run positive effects on real GDP emerged as exports respond to the depreciation and to the favorable price differentials between Swaziland and South Africa as price stability is maintained. Meanwhile the study concludes that the shock from wages has a permanent negative impact on growth.

Finally, given that monetary policy responds largely to domestic inflation in Swaziland it can be concluded in a nutshell that price stability is a prerequisite for the country to realize higher economic growth in the short to medium term.

6.2 Policy Implications
The most underlying conclusion from the forgoing analysis is that monetary policy in Swaziland is influenced by domestic inflation developments and that it translates into lower growth in the short to medium term. The empirical finding of the study provide some guidance
for Swaziland policymakers i.e. both monetary and fiscal policymakers, on the importance of maintaining price stability in order to foster higher economic growth in the short to medium term. For its part, the Central Bank of Swaziland will need to maintain monetary policy consistent with low inflation. The main implied policy recommendation from the study therefore is that in order for monetary policy to translate into growth in the short to medium term policymakers should strive to maintain low inflation by designing policies that will address those factors responsible for inflation in Swaziland as identified in the equation for CPI.

With the majority of Swaziland’s inflation determined by factors outside the policymakers control there is a great challenge for the country to design domestic tailored policies on wage setting that would be commensurate with productivity and also on controlling domestic expenditure to appropriate levels to cushion the negative effects of the external factors on domestic inflation. These emphasizes the importance of fiscal policy in controlling inflationary domestic factors by making sure that civil servants are remunerated based on their productivity and that greater part of government expenditures are directed towards productive projects. Controlling government budget deficit also contributes to increasing domestic savings that are so important in financing economic growth. It is therefore believed that a more aggressive fiscal policy discipline in this perspective will warrant a somewhat less tight monetary policy or a monetary easing from the Central bank hence small declines or increases in growth in the short to medium term.

Maintaining low inflation very close to that prevailing in South Africa should be the main target of policymakers which will not only ease monetary policy but also promote exports competitiveness in the South African markets and attract investments hence economic growth.
Apart from the above short-term recommendations, the country should consider as a long-term plan on how to mitigate external influences on domestic prices. One of the recommendations from a paper on the determinants of inflation in Swaziland was that in order for Swaziland to reduce its dependence on imports, and for policy makers to have greater control to meet the objective of maintaining price stability, there is need to place more emphasis on the promotion of the manufacturing base in Swaziland. This should help to reduce the country’s dependency on imports, and the changes in prices of these imports.

Given the limitations of the monetary policy in Swaziland an alternative monetary policy tool at its disposal is the bank lending channel of monetary policy facilitated through open market operations, reserve requirements and discount facilities. Notwithstanding its inflationary aspect coupled with its less responsiveness to monetary policy given the flexibility of capital mobility within the CMA countries, the bank should adopt this policy and also intensify its effort to encourage commercial banks to finance the small to medium enterprises. In the same vein the bank in partnership with government and the banking sector should vigorously engage in a campaign to encourage the public to borrow for investing in bankable projects whilst discouraging borrowing for consumption.

Given the important role played by an exchange rate depreciation in boosting the economy of Swaziland through its positive impact on exports, for this to translate to economic growth, the resultant increase in export earnings in emalangeni terms must be channelled to the production of more goods for export. It is imperative therefore for government policies to ensure that existing foreign companies are encouraged to re-invest their export earnings on expansion by creating a more conducive business environment in the country.
THE EFFICACY OF MONETARY POLICY ON ECONOMIC GROWTH IN SWAZILAND

APPENDIX

Graph 1. Impulse response of Real GDP to Discount Rate owing to a 1% increase in Exchange Rate

Graph 2. Impulse response of Real GDP to Discount Rate owing to a 1% increase in Credit Extension

Graph 3. Impulse response of Real GDP to Discount Rate owing to a 1% increase in Wages

Graph 4. Impulse response of Discount rate to a 1% increase in Real Credit Extension

Graph 5. Impulse response of Discount Rate and CPI to a 1% increase in Exchange Rate

Graph 6. Impulse response of CPI and Discount Rate to a 1% increase in Wages
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