Money Supply and Economic Growth in Botswana: Evidence from ARDL Approach

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Abstract

The purpose of the paper is to analyse the relationship between money supply and real gross domestic product using an Auto Regressive Distributed Lag (ARDL) model on Botswana from 1989 to 2019. The impact of money supply on economic growth is positive and negative in both the short run and long run respectively. However, the impact is insignificant in support of the monetarist view. Results suggest that monetary policy framework does not play an important role in determining economic activities of Botswana hence there is need to improve the quality of monetary institutions for money supply to be effective in influencing economic performance of Botswana. The results seem to suggest that policy makers should consider stimulating economic activity in Botswana through fiscal policy rather than monetary policy.

Keywords: Money Supply, Economic Growth

1. INTRODUCTION

The objective of the paper is to find the impact of money supply to economic growth while controlling for interest rates and inflation rates in Botswana over a period from 1989 to 2019. Money supply is strongly believed to exert positive influence on economic growth. This issue has been dealt by numerous researchers. This influences individual countries to employ monetary policies which would grease various economic activities thus contributing to economic growth. Increasingly call for both domestic investments and foreign investments and the pattern of consumption are the major reasons behind the control of money supply. Previous research shows that countries’ economies are largely influenced by the monetary policy framework. For instance, quantitative easing and seignorage was a panacea to the restoration of the American economy after the 2007 -2008 financial crisis (World Bank, 2016). However, if wrongly managed, money supply is detrimental to economic performance. Excessive money supply in Zimbabwe was cited as a reason of hyper-inflation which leads to economic meltdown of the Zimbabwean economy from 2005 to 2009 (Gukurume, 2015, Jeffries et al., 2013).

However, it is imperative to point out that there is theoretical evidence in support of the use of money supply to stimulate economic activity according to Keynesians’ theories. An increase in money supply tends to lower the price for borrowing money which stimulates both consumption and lending patterns. In the short run, such an increase in aggregate demand can be correlated with an increase in the total output of an economy. Furthermore, the new Keynesians argue that in the short-run, changes in the money supply seem to affect the real variables like GDP and employment levels because of price-rigidity (price-stickiness) and imperfect information flow in the market. As such government can improve macroeconomics conditions through fiscal and monetary policy (Hussan et al. 2017). On the contrary, monetarist economists have dismissed the Keynesian views and instead argue that the role of government is to control inflation by controlling money supply. Thus, the monetarists view rejects the Keynesian economist’s view that government can “manage” aggregate demand by increasing money supply to stimulate economic growth.

Steve (1997) and Domigo (2001), reveal that economic growth is influenced by an appropriate level of money supply, credit and certain conditions in the financial sector.
Empirically, there is documented evidence on the money supply economic growth nexus from both developed and developing (Maitra 2011, Adusei et al, 2013,). These researchers have documented significant relationship between money supply and economic growth thus supporting the Keynesian view of the importance of money in the real sector of the economy (see Gatawa et al, 2017, Babatude and Shuaibu, 2011, Chaitipa et al 2015). However, other studies failed to support the positive link between money supply and economic growth in support of the monetarist view which does not recognize the importance of money in the economic performance (Ogunmuyiwa and Ekone, 2010, Ihsan and Anjum, 2013, Ehigiamusoe, 2013, Ogunmuyiwa and Ekone, 2010, Babatude and Shuaibu, 2011, Chaitipa et al 2015). In this regard, it is clear that the money supply and economic growth nexus remains an empirical question.

Although several studies have been conducted on the money supply economic growth nexus, little has been researched on the economy of Botswana and most importantly employing an ARDL model. The objective of the paper is to find the impact of money supply on economic growth while controlling for interest rates and inflation rates from 1989 to 2019 is gap is filled by this research. Following is section 2 which gives an overview of recent trends in money supply and GDP growth of Botswana. Section 3 reviews various empirical studies on the subject matter. Data sources and methodology as well as empirical results and discussions are explained and reported in section 4. Section 5 concludes the paper by giving policy recommendations on the empirical studies.

2. Stylised Facts
2.1 Money Supply Trends in Botswana

Over the past 30 years, there have been wider fluctuations of money supply in Botswana. Generally, the money supply measured by M3 declined from 42% to -10% in 1993. This was precipitated by the drive of the bank of Botswana to stabilize inflation through monetary targeting which involves the use interest rates and open market operations.

Figure 1: Trends in money supply

As from 1993, the drive of the policy makers to embark on economic transformation and the adoption of the pula as a legal currency largely contributed to the marked increase in money supply reaching a peak of 70% by 2003. Over the same period, the financial deregulation which resulted in the removal of capital flows, independence of financial institutions and the exchange rate flexibility facilitated the increase in capital inflow from foreign investors. Furthermore, high liquidity and low interest rates encouraged banks to be involved in predatory lending (Sekwati, 2008). The profit generated by commercial banks in form of commission fees made...
them to increase their loan portfolio. The creation of government backed financial institutions like Citizen Empowerment development Authority (CEDA) contributed to the increase in money supply as they extents entrepreneur loans to the citizens of Botswana. Such improvements in financial institutions created confidence among foreign and domestic investors to access more developmental loans. Also the formation of the Botswana Stock Exchange in 1994 induced both domestic and foreign company portfolio investments thus increasing the money supply.

Figure 1 further indicates a decline in money supply from 2003 to 2009. Such a decline was caused by a plethora of factors. Firstly, the increase in bank rate by 100 basis points to 15.25% ignited commercial banks to increase its lending rates thus controlling the liquidity in the market (World Bank, 2016). Secondly, the Bank of Botswana initiated the floating of government bonds and placement of it certificates (BOBCs). The move further tightened the liquidity position of the market and contributed to a decline in broad money supply as private credit deteriorated. Furthermore, the decline in private sector credit was worsened by an appreciation of the pula against the US dollar which dampened the competitiveness of the export sector (World Bank, 2016).

Finally, the birth of the global financial crisis in 2007 negatively impacted the financial sector of Botswana as there was a significant fall in main export revenues especially diamond exports (IMF, 2012). The country was plunged in to liquidity crisis, high loan default as well as lower levels of income as industries reduced their levels of productivity. Financial institutions responded by reducing the extension of credit to various economic units of Botswana. The reduction in money supply was further compounded by the decline in appetite of the local goods by developed countries, foreign investments, and foreign aid. The aftermath of the global financial crisis stabilized the money supply in 2009 as the country devised policies to restore the confidence in the financial sector. Interest rates were lowered, government backed financial institutions meant for citizen empowerment was revitalized, exchange rate was managed and improvements in the quality of institutions brought confidence in the financial sector. These and other factors resulted in marginal gains in money supply which was more stable from 2010 to the current period. This paper established whether the changes in money supply are related to changes in real gross domestic product over the same period.

2.2 Economic growth pattern in Botswana

Figure 2 below depicts changes in economic growth over the 1989 to 2019 period. The policy shift from state-led development to private-led development in the early 1990s resulted in the initial decline in economic growth from 1989 to 1993. Such a decline as short lived. The focus on the new policy of economic diversification in to service and manufacturing sectors, export competitiveness, increased privatization and private investments in various sectors of the economy especially the mining sector contributed to an increase in economic growth to a level high of 10% 1999. Furthermore, the high institutional quality consisting of defined property rights, least corruption levels, independent judicial system as well as efficient political institutions has paved way for increased foreign capital inflows in Botswana from 1993 to 2007 thus contributing to such an increase in economic growth over the same period (World Bank, 2016).

Figure 2 Gdp growth rates for Botswana
On the contrary, the global financial crisis plunged the economy in negative economic growth as the sale of diamond which contributes 80% of the revenue recorded its lowest level (IMF, 2016). The revival of the diamond sector after the global financial crisis together with the robust institutional framework contributed to a sharp gain in economic growth to a record level of 11% in 2014. This same period witnessed influx of foreign investments a reinvigoration of citizen empowerments in the production sector (World Bank, 2016).

The decline in the mineral market especially the diamond and copper contracted the economy from 2014 (IMF, 2016). The decline in energy production added to a sluggish growth of the economy (IMF, 2016). The continued weakening of the global diamond market further retarded the economy of Botswana to 2018 though marginal gains were made at the backdrop of fiscal buffers and prudent policies which shielded the economy from further downfall (World Bank, 2019). The global pandemic of COVID 19 crippled the entire globe with no exception to Botswana. The expectation is a continued decline in growth prospects as Botswana continued to be exposed to COVID-19 which is stalling economic activities in majors sectors of the economy.

**3. Literature review**

There has been a debate regarding the exact effect of money supply to economic growth. Various researchers failed to reach consensus on money supply economic growth nexus. Wide range of literature has found a positive and significant effect of money supply on economic growth. Hussain and Haque (2017), employed Vector Error Correction Model (VECM) model and realised a significant and positive effect of money supply to the economy of Bangladesh. The results were supported by the works of Chaitipa (2015) on the ASEAN Economic Cooperation (AEC) open region where money supply was found to have a strong positive influence on economic growth. The results by Ogunmuyiwa and Ekone (2010) on the Nigerian economy are in support of the Keynesian school of thought which hinges on the importance of money supply on economic performance. The results show a positive and significant impact of money supply on the Nigerian economy after using Error Correction model over the period 1999-2014. Similarly, Babatude and Shuaibu, (2011), used an ARDL approach and concluded that money supply positively influence economic performance over a period from 1975 to 2008. Likewise, Anton (2015) realised the importance of broad money supply (M3) on the economic growth of Indonesia while using an ARDL approach. There are other studies who found positive and significant impact of money supply on economic growth (See Njimanted et al.2016, Prasert et al. 2015, Havi and Enu, 2014).

Chude and Chude (2016) also researched the impact of broad money supply and economic growth for Nigeria during 1987 to 2010 and they used ARDL model, their finding indicated that money supply and gross domestic product have a positive sign. Mohammad, Wasti and Hussain (2009), made an empirical investigation between
money supply, government expenditure, output and price for Pakistan for the period of 1977 to 2007, and using the econometrics model, Johanson cointegration model, they found that money supply (M2) has a positive impact on economic growth. Furthermore, Hameed and Amen (2011) investigated the impact of monetary policy on gross domestic product (GDP) for Pakistan and they found growth in money supply greatly affects GDP. Ihsan and Anjum (2013) examined the impact of supply (m2) and GDP for Pakistan and they found money supply is affected by GDP. Zapodeanu and Cociuba (2010) investigated linking money supply with the gross domestic product for Romania over 10 year’s period, using Engle-Granger and ARIMA model. They found out that money supply and gross domestic product have a direct relationship.

Maitra (2011) investigated the anticipated money, unanticipated money, and output variation for Singapore during 1971 to 1972, using cointegration model and found out that money supply and output are cointegrated. Aslam (2016) also investigated impact of money supply on economic growth for Sri Lanka for the years 1959-2013, using Multivariate econometrics variable. He found that money supply has a positive impact on the economic growth.

Other scholars reported a negative impact of money supply on economic growth. For instance, Adusei (2013) realised that the growth of money supply undermined the economic development of Ghana over a period from 1971 to 2010. The study employed a Fully Modified Ordinary Least Squared (FMOLS). These results were supported by the works of Gatawa et al. (2017), who revealed that money supply negatively impacted economic growth of Nigeria after employing VECM over a period spanning from 1973 to 2013. Furthermore, Ihsan and Anjum (2013) examined the impact of money supply (M 3) on GDP for Pakistan between 2000 and 2011, and found it to be negative and statistically insignificant. Also, Ehigiamusoe (2013) failed to find the significant role of money supply economic growth of Nigeria using data from 1980 to 2012. A study by Omodero (2019) supported the monetarist view in the economy of Nigeria however broad money supply was found to have significant impact on the Ghanaian economy in support of the liquidity preference theory by Keynes. The study adopted ordinary least squares regression using data over a period from 2009 to 2018 but evidence of monetarist failed to be explained in Ghana where a positive and significant impact of money supply was found to exist. The study carried in Kenya by Kaman (2014) indicated that money supply is in highly insignificant to the Kenyan economy. These results were further supported by Chipote and Palesa (2014) in South Africa after employing error correction model and Johansen Co-integration over a period from 2000 to 2010.

4. Empirical analysis.

An Auto Regressive Distributed Lag (ARDL) model was employed in order to ascertain the impact of money supply to economic growth of Botswana. The Data used was retrieved from the World Development Indicators (WDI). Economic growth and money supply are proxied with gross domestic product growth per capita and M3 respectively. Inflation rate and interest rates are used as control variables and all the variables are transformed into logarithmic form. Accordingly, the ARDL model is specified as follows

$$\Delta GDP_t = \alpha_0 + \sum_{t=1}^{n} \alpha_1 \Delta RGDP_{t-1} + \sum_{t=0}^{n} \alpha_2 \Delta MS_{t-1} + \sum_{t=0}^{n} \alpha_3 \Delta RINT_{t-1} + \sum_{t=0}^{n} \alpha_4 \Delta INF_{t-1} + \beta_1 RGDP + \beta_2 MS_{t-1} + \beta_3 RINT_{t-1} + \beta_4 INF + \varepsilon_{1t}$$

Where:

RGDP = Real Gross domestic product

MS= Broad Money

INF = Inflation rates
RINT = Real Interest rates

$\alpha_0$ = constant variable

$\alpha_1-\alpha_4$ and $\beta_1-\beta_4$ = regression coefficients  \( \varepsilon \) = error term

The parameter estimates from Table 1 show that money supply has a positive effect to economic growth as expected in the short run but the impact turn to be negative in the long run as expected due to the inconsistencies in the financial sector. This is in line with the results by Chipotle and Pales (2014). However, both the short run and long run impact are statistically insignificant. The significance of the error correction term indicates that the model returns to equilibrium within a year. The results imply that the monetary policy in Botswana is not effective in addressing the economic performance of Botswana. Rather, the monetary policymakers need to improve their financial institutions so that they play a pivotal role in ensuring effectiveness of the monetary policy. These results are consistent with the findings of Chipotle and Pales (2014) and Kaman (2014) on South Africa and Kenya respectively. This can be attributed to the similarity in growth level, policy frameworks and business culture embodied in these economies. Furthermore, South Africa and Botswana are in the same regional trading block where they share same economic resources. However the results contradict numerous studies which supported the Keynesian view of the importance of money supply on economic growth of various economies (See Njimanted et al.2016, Prasert et al. 2015, Havi and Enu, 2014).

Table 1: ARDL results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Short run effect</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>6.78</td>
<td>0.015**</td>
</tr>
<tr>
<td>Money supply</td>
<td>0.02</td>
<td>0.3544</td>
</tr>
<tr>
<td>Inflation rate</td>
<td>0.43</td>
<td>0.2604</td>
</tr>
<tr>
<td>Interest rate</td>
<td>0.06</td>
<td>0.7108</td>
</tr>
<tr>
<td>Error correction term</td>
<td>-1.46</td>
<td>0.0001***</td>
</tr>
<tr>
<td><strong>Long run effect</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Money supply</td>
<td>-0.04</td>
<td>0.5857</td>
</tr>
<tr>
<td>Inflation rate</td>
<td>0.2</td>
<td>0.4269</td>
</tr>
<tr>
<td>Interest rate</td>
<td>-0.2</td>
<td>0.3336</td>
</tr>
</tbody>
</table>

Source: Author compilation

The robustness of the model is checked by the following econometric test. It is necessary for the series to be stationary at level and after first difference but not after second difference. The results in in Table 2 below confirmed that real gross domestic product per capita, money supply and real interest rates are stationary at level while inflation attains stationarity after first difference thus supporting the use of the ARDL model.

Table 2: Unit root test

<table>
<thead>
<tr>
<th></th>
<th>AT TREND</th>
<th>RESULTS</th>
<th>AT LEVEL</th>
<th>AT FIRST DIFFERENCE</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>2.97</td>
<td>Stationery</td>
<td>0.0000</td>
<td>0.0000</td>
<td>Stationery at level</td>
</tr>
<tr>
<td>MS</td>
<td>8.6</td>
<td>Stationery</td>
<td>0.0000</td>
<td>0.0000</td>
<td>Stationery at level</td>
</tr>
<tr>
<td>INFL</td>
<td>3.5</td>
<td>Non-stationery</td>
<td>0.6637</td>
<td>0.0000</td>
<td>Stationery at first difference</td>
</tr>
<tr>
<td>RITR</td>
<td>5.3</td>
<td>Stationery</td>
<td>0.0007</td>
<td>0.0000</td>
<td>Stationery at level</td>
</tr>
</tbody>
</table>

Source: Author compilation
Secondly, is the stability test of the ARDL model. Figure 3 and 4 for CUSUM and CUSUM square respectively confirms the stability of the ARDL model since the plots are falling within the critical limits.

**Figure 3: CUSUM**

![CUSUM](image)

*Source: Author compilation*

**Figure 4: CUSUM Square**

![CUSUM Square](image)

*Source: Author compilation*

Lastly, Table 3 show that the ARDL model is stable hence the long run cointegration is confirmed by the Wald test which shows the F value of 5.85 to be greater than critical value of 4.01.

**Table 3: Wald test**

<table>
<thead>
<tr>
<th>Test statistic</th>
<th>Value</th>
<th>Degrees of freedom</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-statistic</td>
<td>5.85</td>
<td>(4, 20)</td>
<td>0.0028***</td>
</tr>
<tr>
<td>Chi-statistic</td>
<td>23.38</td>
<td>4</td>
<td>0.0001***</td>
</tr>
</tbody>
</table>

*Source: Author compilation*

The absence of serial correlation is revealed by Table 4 below for Breush-Godfrey LM test where the p value is realized to be greater than 0.05.

**Table 4. Breush-Godfrey LM test**
5. Conclusion

The results of the ARDL approach indicate that money supply has a positive and negative impact on economic growth in the short run and long run respectively. However, the impact is highly insignificant thus contradicting the monetarist view of the importance of money on economic performance. The paper can conclude the need to strengthen the financial institutions for monetary policy to be effective. The economic players are encouraged to use loanable funds for investments rather than consumption and the quality of institutions need to be improved for efficient allocation of funds. The economy of Botswana can best be addressed by the fiscal policy rather than the monetary policy.

References


