INFLATION, MONEY AND ECONOMIC GROWTH IN BOTSWANA

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ABSTRACT

This paper investigates the relationship between inflation, money, velocity of money and economic growth in Botswana. Quarterly data from 2007 to the last quarter of 2016 was analyzed using multiple regression analysis on Statistical Package for the Social Sciences (SPSS). Inflation was the dependent variable and money supply, velocity of money and GDP were independent variables. The regression results show that a positive and significant relationship exists between GDP and inflation, and that a negative and significant relationship exists between Money supply and inflation in Botswana, In addition, there is a negative relationship between velocity of money and inflation. Overall, although the variables do no hold the hypothesized signs, this study concludes that inflation in Botswana is influenced by economic growth, money supply and velocity of money which are all found to be statistically significant. Therefore appropriate policies must be taken by policy makers and relevant authorities to control money supply in order to have a low, stable, and predictable level of inflation in the country.

Keywords: Inflation, money, economic growth, quantity theory of money, Botswana

Introduction
The relationship between inflation, money supply and economic growth has attracted attention across the globe. For instance, Bozkurt (2014) posits that an increase in money supply causes an increase in the prices of goods and services. However, mixed results have been found by different economists who suggest that it may have both positive (Keynesian view) and negative (Neoclassical view) respectively (Bozkurt, 2014).

Further, there are a number of theories explaining the causes of inflation, and these are the demand-pull inflation, the cost-push inflation, and the quantity theory of money. The possible sources of inflation include rising costs such as wages, profits, imported inflation, exchange rate, commodity prices, external shocks, exhaustion of natural resources, and taxes (Haque & Qayyum, 2006). Quantity theory assumes that the changes in income arise due to changes in prices and that output is always at its permanent level and as a result the price level is determined by the money supply via the operation of real balance effect (Allsopp and Vines, 2000). Bozkurt (2014) states that inflation adversely disturb growth, development of financial sector and

unprotected poor section of the population, and (Cecchetti, 2000) agreeably states that even insignificant levels of inflation damages the real growth.

In Botswana, trends in inflation and real GDP show that inflation has been anchored within the Bank of Botswana's target range of 3 to 6 percent since 2013 while GDP has been performing below potential. Inflation decreases real income and also increases uncertainty. Despite these adverse effects of inflation on an economy, Alimi (2012) emphasized that it is generally agreed that the primary objective of world leading bank's monetary policy is price stability (King, 1999 & Blejer et al, 2000) and central banks devote themselves to low inflation (Goodfriend, 2001). As a result, central banks adopt inflation as the main objective of their monetary policies, and have their objectives set for inflation explicitly and implicitly when necessary (Qayyum, 2006). By extension, the Bank of Botswana's monetary policy is to achieve price stability. This is defined as a sustainable level of inflation that is within the medium-term objective range of 3 - 6 percent (Bank of Botswana, 2012). This entails the formulation and implementation of policies aimed at influencing interest rates and/or growth of money supply to affect economic performance, particularly in relation to inflation. It is argued that sufficiently tight monetary policy maintained for sufficiently long time could halt even the most deeply rooted inflation (Friedman, 1963). One would wonder if this policy stance have had an effect on economic growth in Botswana.

Moreover, most of the studies in this subject matter were conducted in developed countries, though with contradicting results. This creates motivation for this study, especially with the monetary policy stance that focus on the medium-term objective range of 3 - 6 percent in Botswana. To this end, we expand on this matter by incorporating another variable in the quantity theory of money framework known as velocity of money.

Problem statement

According to Babatunde and Shuaibu (2011), there have been different views on the determinants of growth in Nigeria and other countries, when examining the implication of inflation and money supply as part of a group of independent variables. While some researchers suggest the existence of a negative relationship between money supply, inflation and growth, others found a positive relationship. This paper therefore, seeks to estimate the relationship between inflation, money, velocity of money and economic growth in Botswana using time series data analysis techniques.

In order to address the stated problem, the following research questions have been formulated:
1. How does inflation influence money supply?
2. How does inflation affect velocity of money?
3. How does inflation impact on growth of the economy?

Objectives

The main purpose of this paper is to investigate the relationship between inflation, money, velocity of money and economic growth in Botswana.

Specifically, the paper seeks to establish the link between:
1. Money supply and inflation in Botswana
2. Economic growth and inflation in Botswana
3. Velocity of money and inflation in Botswana

Hypothesis

Based on literature review and quantity theory of money, we hypothesize as follows:
    H1: There is a positive relationship between money supply and inflation in Botswana
    H2: There is a negative relationship between inflation and economic growth in Botswana
    H3: There is a positive relationship between velocity of money and inflation in Botswana

Significance of the study

Inflation, money supply, velocity of money and economic growth are the major macro-economic objectives that every economy take a close look at and monitor. Every economy wants to have low, stable and predictable inflation, high and sustainable economic growth and the money supply at a correct and optimum level. Because of the importance of these variables to the proper functioning of the economy, any slight change of these to a negative direction tend to destabilize or impact negatively on the whole economy. Due to this, the authors has found it worthwhile to assess the relationship that exists in such fundamental macro-economic factors or components. The ultimate aim being that the results can be useful to policy makers within the country. The relationship between these variables is important as it will inform policy makers about the appropriate policy measures to take to stimulate the economy. In addition, this paper seeks to contribute to a few literature on this area of research in Botswana.

In the next section we explain the theory and empiricism behind the link between money supply growth, inflation and growth and describe the methodology in section 2. Section 3 of the paper reports the findings and section 4 concludes the paper and present the recommendations.

Review of Literature

Theoretical review

Several theories have been advanced explaining the causes of inflation, and these include the demand-pull inflation, the cost-push inflation, and the quantity theory of money. However, for the purposes of this study, we adopt the quantity theory of money as presented by Qayyum

(2006). This theory is deemed more appropriate for this the study, in cognizant of the monetary policy stance of achieving price stability. In Botswana, this is achieved by keeping inflation within the medium-term objective range of 3-6 percent (Bank of Botswana, 2012).

Qayyum (2006) illustrates that the quantity theory of money reveals that there is a relationship between money supply (M), velocity of money (V), prices (P) and the real income (Y) and can be written as an identity

$$MV=PY \quad ... \ldots \quad \ldots \quad \ldots \quad \ldots. \quad \ldots \quad \ldots. \quad \ldots. \quad \ldots. \quad (1)$$

The money supply is determined outside the system, hence exogenous, income velocity of money is dependent of the other variables in the identity 1, and Y is real income. Under these assumptions, the equation of exchange can be written as theory of price determination. The equation 1 can be written into price equation as:

$$P= MV/Y \ldots. \quad \ldots. \quad \ldots. \quad \ldots. \quad \ldots. \quad \ldots. \quad \ldots. \quad \ldots. \quad \ldots. \quad (2)$$

Taking Log on both sides, the equation becomes:

$$\log P = \log M + \log V - \log Y \quad \ldots. \quad \ldots. \quad \ldots. \quad \ldots. \quad \ldots. \quad (3)$$

When differentiating Equation 3, the equation for inflation becomes:

$$\frac{1}{P}\frac{dP}{dt} = \frac{1}{M}\frac{dM}{dt} + \frac{1}{V}\frac{dV}{dt} - \frac{1}{Y}\frac{dY}{dt} \quad .... \quad \ldots. \quad \ldots. \quad .... \quad \ldots. \quad \ldots. \quad (4)$$

or

$$g_{p} = g_{m} + g_{v} - g_{y}$$

Qayyum (2006) reveals that equation 4 indicates that the growth in prices (i.e., the rate of inflation) is determined by the growth in money supply, growth in velocity, and the growth in real income. Further, in a simple version of quantity theory, it is assumed that the income grows at the long-run rate and the velocity of money remains constant. Under this assumption inflation is determined by the change in money supply. Friedman and Schwartz (1982) asserted that this is an extreme proposition that the velocity is constant, and as thus it must be rejected. The velocity and income grow slowly and this behavior is independent of the behavior of money supply or prices (Laidler, 1997). Quantity theory identified that the money supply is the key factor that effects the changes in price level (Laidler, 1997). When the term 'error' is added to capture the effect of the variables, the model for analysis of inflation becomes;

$$g_{p} = \beta_{o} + \beta_{m}\,g_{m} + \beta_{v}\,g_{v} - \beta_{y}\,g_{y} + u \quad \ldots. \quad \ldots. \quad \ldots. \quad \ldots. \quad (5)$$

Equation 5 indicates the relationship between the price level and its determinants. These factors consist of money supply (M), real income (Y) and other factors affecting money demand. These other factors, which include velocity (V), can be called proportionality factors. If other determinants of real income and money supply are constant, this equation indicates the direct relationship between money supply and increase in inflation rate (Qayyum, 2006). Money can be measured in three categories being M1, M2 and M3. According to Ritter, Silber and Udell (1996), M1 is the most liquid category and includes currency outside banks and checking accounts.M2 drops a shade lower on the liquidity scale by adding assets that are most easily and most frequently transferred into checking accounts such as savings accounts and small

denomination certificates of deposits. Lastly, M3 adds a number of other items most of which are held as short term investments. The three categories sum up to the total amount of money within the economy or the country's money supply which is an important determinant of economic performance.

Burns and Ferrell (2010) expressed that much of the debate about the most useful framework for analyzing aggregate economic relations centers on the relationship between aggregate spending and the money supply. He further defined the ratio of total spending to the money stock/ supply as the velocity of money. On the other hand, (Amadeo, 2017) defines velocity of money as the rate at which people spend cash; it may also be defined as the frequency at which money is exchanged from one transaction to another and how much a unit of currency is used to buy goods and services during a given period. It is, therefore, measured as a ratio of Gross Domestic Product (GDP) to a country's total money supply. The more money out there sitting idle in other peoples' pockets, that is money in circulation, the slower the velocity becomes. Therefore, if the Central Bank continues to print money the weaker and weaker the velocity of money is getting, the weaker and weaker the economy gets.

Money is primarily defined as a medium of exchange for goods and services or for settlement of debt and the total stock of money circulating in an economy is the money supply which simply refers to the total currency in circulation over a certain period of time (Singh, 2010). On the other hand, inflation is defined as the general rise in the price of goods and services over time (Amadeo, 2017). Meanwhile Schumpeter (2017) defined economic growth as the increase in the amount of goods and services produced per head of the population over a period of time. Economic growth is measured by Gross Domestic Product (GDP). Barro and Sala-i-Martin (1995) defined GDP as the market value of all final goods and services produced in a country.

Empirical review

Empirical review on the relationship between money, velocity of money, inflation and growth in Botswana has been limited. However, a number of studies have been done in different countries concerning money, velocity of money, inflation and economic growth, separately.

From Botswana context, Haile Kebret (2013) concluded that price inertia, real GDP, money supply and South African prices play a dominant role in determining inflation in Botswana. The study examined the determinants of inflation in Botswana by identifying the factors that have influenced its movement over time. Auto Regressive Distributed Lag (ARDL) estimation technique was used and employed quarterly data from the first quarter of 1990 to the fourth quarter of 2010 to estimate the model. The results showed that the identified variables are significant and have the theoretically expected signs.

Galebotswe (2012) analysed the effects of external conditions on Botswana's output fluctuations. The results suggest that the main sources of macroeconomic fluctuations are world oil prices, monetary aggregates, prices and nominal exchange rates. Further, he lamented that world oil

prices and inflation are strongly counter-cyclical. This lends support to the view that supply-side determined business cycle models are more relevant for Botswana than the conventional demand-driven models.

Sekwati (2008) investigated whether M1, M2 and M3 monetary aggregates in Botswana exhibit stability characteristics as achieved by employing stationary tests and co-integration techniques to monthly data on those aggregates. His results indicated a stable relationship for M2 and M3 aggregates but not for M1, suggesting that M2 and M3 may be used as targets of monetary policy.

In a more recent study and in perspective of Africa, Ndoricimpa (2017) studied the threshold effects of inflation on economic growth in Africa. The study examined nonlinearities in the inflation growth nexus in Africa. A dynamic panel threshold regression was applied to account for the potential endogeneity bias in the model. The findings of the study confirmed the existence of nonlinearities in the inflation-growth nexus. An inflation threshold of 6.7 % was estimated for the whole sample, 9% for the sub-sample of low-income countries and 6.5% for middle-income countries. The findings also suggested that low inflation is growth-enhancing for the sub-sample of middle income countries but neither affects economic growth for the whole sample nor for the sub-sample of low-income countries.

Fischer (1993) was one of the pioneer researchers that examined the presence of nonlinearities in the inflation-growth nexus. Fisher exogenously determined the inflation threshold by dividing the sample into three threshold levels; inflation rate less than 15%, inflation between 15% and 40% and inflation above 40%. Using spline regression techniques on a panel of 93 developed and developing countries, he concluded when inflation is low, its impact on economic growth is positive but turns to a negative as inflation increases. Following Fischer (1993), Bruno (1995) used a panel of 127 countries and finds that inflation has a positive impact on growth when it goes up to 15-20% range but when it goes beyond 20-25%, its impact becomes negative.

Moreover, Qayyum (2006) studied money, inflation and growth in Pakistan and the study indicated that there is a strong relationship between the money growth and inflation. The correlation coefficient between money growth and current real GDP growth was 0.226 and it was 0.069 with the previous year's money growth and current year's real GDP. Also the results showed that money growth at first round affect real GDP growth and at second round, the money growth effects inflation in Pakistan.

Meanwhile, Bozkurt (2014) examined money, inflation and growth relationship in Turkey and his findings revealed that the increase in money supply and velocity of money causes inflation in the long run. Their results were similar to those of McCandless and Weber (1995) and Rolnick and Weber (1998) who provided the empirical evidence that there is a high correlation between money supply and inflation.

Moroney (2002) developed a long-run version of the quantity theory of money growth, real GDP growth, and inflation and found that the cross-sectional inflation are explained almost entirely by average broad money growth rates. The author asserted that countries experiencing high money growth and inflation had estimated coefficients of money supply (M2) growth strikingly close to one, strongly in conformity with the quantity theory. Comparatively, in countries with relatively low money growth and inflation, the estimated money growth coefficient is only 0.69; hence the quantity theory offers a less complete explanation of inflation. Money growth and GDP growth are nearly connected, consistent the long-run monetary super neutrality. He concluded that the quantity theory of money is a reliable model of inflation for most countries, but not those experiencing slow long-run money growths.

On the other hand, Ramsaran, R. (1992) underscores that the impact of inflation on velocity can be ambiguous, since short term reactions may not be the same as in the long term.

Research Methodology

Research design

In determining the link between money, velocity of money, inflation and growth in Botswana; this study employs the quantity theory of money. This study follows from the model by (Qayyum, 2006) who used the quantity theory of money to establish the relationship between money inflation and growth in Pakistan. To achieve the objectives, correlation coefficient and regression analysis in SPSS were used. *Correlation coefficient 'r'* is a number that represents the level of relationship between two individual variables (Washington, Karlaftis, & Mannering, 2010). Here, correlation coefficient will assist in identifying the relationship between money, velocity of money, economic growth and inflation.
In order to apply the quantity theory of money, there is need of collection of all the necessary components.

Data and Sampling

Secondary data was collected from Bank of Botswana annual reports, internet and newspapers. However, in this research, most of the statistics about inflation, money supply, velocity of money and economic growth of Botswana were obtained from the Bank of Botswana Financial Statements (BFS) and Bank of Botswana Annual Reports. That data covered the first quarter of 2007 to the final quarter of 2016. This period was mainly chosen because of data availability. Convenience sampling method was therefore used which a type of non-probability is sampling method that involves the sample being drawn from that part of the population that is close to hand.

Procedure of Data Collection

First, the researcher collected statistics on inflation rates, economic growth (GDP) and money supply from the Bank of Botswana Financial Statements and Annual Reports for the period from the first quarter of 2007 to the final quarter of 2016, then derived the velocity of money from the equation of exchange where GDP is the ratio of money supply. The model of quantity theory of money was used in this study as shown by equation 6:

$$\text{Log P} = \text{Log M} + \text{Log V} - \text{Log Y} \qquad (6)$$

Measurement of Variables:

Table 1 gives the symbol, measurement and hypothesized sign of the variables used as follows:

Inflation: is the general upward price movements of goods and services in the economy. It was measured using the consumer price index (CPI) and is presented as Log P measured as a percentage.

Velocity: the velocity of money. It has been presented as Log V and is defined as the ratio of nominal GDP to money supply (M) which has been presented as Log M.

Money supply: resembles the variations in the monetary sector of the economy measured in millions of Pula and represented as Log M. Broad money stock or M2 has been used to measure money supply.

Real GDP: is presented as Log Y measured as real GDP per capita. According to Khan and Hye (2013), how income per capita affects the velocity of money is dependent on the income elasticity of demand for money. If it is greater than one, there exist an inverse effect of per capita income on money velocity, vice versa.

Table 1: Measurement of variables

VARIABLE	SYMBOL	MEASUREMENT	HYPOTHESIZED SIGN
Dependent:			
Inflation	Log P	% rate of inflation	
Independent:			
Money Supply	Log M	Millions of Pula	+
Velocity of Money	Log V	GDP/MS	+
National Income	Log Y	GDP	-

Data Processing

The quantity theory of money was used so as to find out whether there is any significant link between inflation, economic growth, money supply and velocity of money. In addition, the spearman's correlation was used to establish the relationship between the mentioned variables. Furthermore, regression analysis was used to test the significance of the relationship between the three variables using SPSS to process the data.

Results and Discussions

This study used quarterly data on inflation, GDP and money supply. The sample period runs from January 2007 to December 2016, and it yielded a total of 40 observations.

Data transformation

Quarterly data on inflation, real GDP and Money Supply were obtained BFS whilst velocity of money was calculated as a ratio of GDP to money supply. All this data was transformed to Logarithms as per quantity theory of money model.

Descriptive Analysis

Descriptive analysis of the variables were processed on SPSS and yielded 40 observations as shown in Table 2:

Table 2: Descriptive Statistics

	N	Minimm	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistc	Statistic	Statistic	Statistic	Statistic	Statistc	Std. Error	Statistic	Std.Error
Log_Inflatin	40	-1.57	-.84	-1.2218	.20532	-.171	.374	-.711	.733
Log_GDP	40	4.17	4.36	4.2741	.05761	-.008	.374	-1.488	.733
Log_MS	40	4.45	4.85	4.6709	.11062	.035	.374	-.883	.733
Log_Velocity	40	.89	.94	.9153	.01107	.152	.374	.158	.733
Valid N(listwise)	40								

Inflation and GDP are negatively skewed, -0.171 and -0.008 respectively, whilst Money Supply and Velocity are positively skewed, 0.035 and 0.152 respectively.

Correlation Analysis

A correlation matrix was generated to find out the level and direction of the relationship among the variables using SPSS as shown in Table 3.

Table 3: Correlation Matrix

		Log Inflation	Log GDP	Log MS	Log Velocity
Log Inflation	Pearson Correlation	1	-.760[**]	-.785[**]	.679[**]
	Sig. (2-tailed)		.000	.000	.000
	N	40	40	40	40
Log GDP	Pearson Correlation	-.760[**]	1	.935[**]	-.715[**]
	Sig. (2-tailed)	.000		.000	.000
	N	40	40	40	40
Log MS	Pearson Correlation	-.785[**]	.935[**]	1	-.917[**]
	Sig. (2-tailed)	.000	.000		.000
	N	40	40	40	40
Log Velocity	Pearson Correlation	.679[**]	-.715[**]	-.917[**]	1
	Sig. (2-tailed)	.000	.000	.000	
	N	40	40	40	40

**. Correlation is significant at the 0.01 level (2-tailed).

Preliminary analysis were performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity. The results show a strong, negative correlation between Inflation and GDP, with r = -0.760, p<.001, indicating that high level of inflation is associated with low level of GDP and vice versa. There is a strong, positive correlation between velocity of money and inflation, with r = .679, p<.001, indicating that high levels of velocity is associated with high GDP. The results also show that there is a strong negative relationship between money supply and inflation, with r = -0.785, p<.001, indicating that a high level of money supply in the economy, leads to low inflation. All the above correlations were significant.

Regression Analysis

The regression model retained a high r-square value of 0.761 which implies that 76% of the variation in inflation which is the dependent variable is explained by the independent variables in the model. This shows a good explanatory power or goodness of fit of this model in estimating the relationship. The regression output is illustrated in Table 4.

Table 4: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	225.398	47.675		4.728	.000
	Log_GDP	50.660	11.244	14.215	4.505	.000
	Log_MS	-48.043	10.252	-25.883	-4.686	.000
	Log_Velocity	-238.988	52.147	-12.884	-4.583	.000
a. Dependent Variable: Log_Inflation						

The significance of the independent variables are shown by sig- or p-values in Table 4. These show the importance of Log GDP, Log MS, and Log Velocity to the dependent variable, Log inflation. The results shows that the independent variables are statistically significant in determining inflation in Botswana (p-values=0.000). Specifically, the results show a positive and significant relationship between GDP and inflation, with beta = 14.215, and sig 0.000, indicating that GDP is significant but different from the hypothesized negative sign. The beta coefficient shows that a 1% increase in inflation will increase GDP by 14.2%.

Moreover, the results show that there exists a negative significant relationship between Money supply and inflation in Botswana, with Beta = -25.883, sig 0.000, indicating that a 1% increase in inflation will reduce money supply by 25.9%. Though this is significant the negative sign differs from the hypothesized positive sign. Although this relationship does not hold the expected sign, this study is of the view that indeed money supply is also an important factor in influencing the inflation in the country. In addition, there is a negative relationship between velocity of money and inflation, with Beta = -12.884, sig 0.000, indicating that a 1% increase in inflation will reduce velocity of money by 12.8%. Though significant the negative sign is different from the hypothesized sign.

Overall, although the variables do no hold the hypothesized signs, this study concludes that inflation in Botswana is influenced by economic growth, money supply and velocity of money which were all found to be statistically significant. Therefore appropriate policies must be taken by policy makers and relevant authorities to have a low, stable, and predictable level of inflation in our country.

Discussion of findings

These results indicate that, from the regression analysis, we can say that the Keynesian theory of money has been confirmed where with regard to inflation effect on economic growth, the relationship is positive. In particular, the results show a positive relationship between GDP and inflation, with beta = 14.215, and sig 0.000, indicating that GDP is significant but different from the hypothesized negative sign. This outcome is contrary to the findings of Ndoricimpa (2017) who studied the threshold effects of inflation on economic growth in Africa whose findings also suggested that low inflation is growth-enhancing for the sub-sample of middle income countries but neither affects economic growth for the whole sample nor for the sub-sample of low-income countries.

With Botswana being a middle income country, the results are thus contrary. This study found a negative and significant relationship between Money supply and inflation in Botswana. This is contrary to the findings of Bozkurt (2014) who examined money, inflation and growth relationship in Turkey and his findings revealed that the increase in money supply and velocity of money causes inflation in the long run.

Conclusions

This paper investigates the relationship between inflation and; money, velocity of money, and economic growth in Botswana from the first quarter of 2007 to the final quarter of 2016. In particular, the paper seeks to establish the link between: 1) Money supply and inflation in Botswana, 2) Economic growth and inflation in Botswana and, 3) Velocity of money and inflation in Botswana.

The results from the correlation analysis, reveals that there is evidence of a strong and negative relationship between inflation and economic growth. Precisely, inflation impacts growth negatively to the magnitude of 76 percent. An increase in inflation would, therefore, reduce growth. The paper also establishes and concludes that, consistent with economic theory, there is a strong and negative correlation between velocity of money and inflation, with an increase in velocity of money explaining over 67 percent of variations in prices. Lastly, regarding money supply and inflation, the paper finds and concludes that there is a very strong and negative correlation between money supply and inflation, accounting for over 78 percent of the variations in inflation, again consistent with economic theory.

The regression results were all significant indicating that inflation in Botswana is influenced by GDP, velocity of money and money supply. However the expected signs were not obtained which was not consistent with economic theory.

Recommendations

Since inflation is influenced by money supply, GDP and velocity of money, the Government should come up with policies geared towards stimulating economic activity. This may come in the form of government spending, and other related fiscal policies that are engines for a sustainable economic growth. On the other hand, the Central Bank should regulate money supply through the use of policy instruments such as reserve requirement ratio and open market operation since money supply is vital for inflation. Moreover, as it has always been the case, Bank of Botswana should as well continue to pursue its monetary policy through the use of the Bank Rate to ensure that inflation is within the desired objective range of 3-6 percent. With this, the country will be able to control inflation as well as to enhance economic growth. All of which fall under the mandate of a Central Bank.

Areas for future research

Future research could be conducted on the relationship between the variables but on an extended dataset which could give explanation to the reasons for the unexpected signs. Further, future research could be done on the variables separately and perhaps using other relevant economic theories as opposed to the quantity theory of money.

References

Alimi, S. R. (2012). The quantity theory of money and its long-run implications: empirical evidence from Nigeria. European Scientific Journal, ESJ, 8(12).

Allsopp, C. and Vines (2000). The assessment: Macroeconomic policy. *Oxford Review of Economic Policy, 16*(4), 1-32.

Amadeo, K. (2017, November 12). Why inflation is as violent as a mugger. *The Balance*. Retreived from; https://www.thebalance.com/what-is-inflation-how-it-s-measured-and-managed-3306170

Babatunde, M.A. and Shuaibu .M.I. (2011). An EmpIrical Analysis of Bank Lending and Inflation in Nigeria. The Indian Economic Journal, *59*(3), 127-137.

Babatunde, M.A. and Shuaibu .M.I. (2011). Money Supply, Inflation and Economic Growth in Nigeria. *Asian-African Journal of Economics and Econometrics, 11*(1), 147-163.

Barro and Sala-i-Martin. (1995). Economic Growth. *Economic Dynamics and Control, 21*(4-5), 895-898.

Barron, P. (2010). The Velocity of Money and the Business Cycle. Retrived on 04. 03.2018 from; http://patrickbarron.blogspot.com/2010/03/velocity-of-money-and-business-cycle.html

BOB. (2012). *Annual Report.*

Bozkurt, C. (2014). Money, Inflation and Growth Relationship: The Turkish Case. *International Journal of Financial Issues, 4*(2), 309-322.

Bruno, M. (1995). Inflation and growth in an integrated approach. *The Macroeconomics of the Open Economy.*

Burns, A. F., & Ferrell, R. H. (2010). Inside the Nixon administration: the secret diary of Arthur Burns, 1969-1974: University Press of Kansas.

Cecchetti, S. G. (2000). Making monetary policy: objectives and rules. *Oxford Review of Economic Policy*, *16*, pp. 43-59.

Fischer, S. (1993). The Role of Macroeconomic Factors in Growth. *Economic Fluctuations and Growth, Monetary Economics, 32*(3), 485-512.

Friedman, M. (1963). *Inflation: Causes and Consequences.* New York: Asia Publishing House.

Friedman, M., Schwartz, A. J. (1983). *Monetary Trends in the United States and the United Kingdom: their relationship to income, prices and interest rates.* The University of Chicago Press.

Galebotswe, O. (2012). Macroeconomic fluctuations in Botswana, PULA: *Botswana Journal of African Studies* Vol. 26, No. 1, 2012. Issue # 46

Goodfriend, M. (2001). Maintaining Low Inflation: Rationale and Reality Challenges for Central Banking (pp. 187-203): Springer.

Haile Kebret, T. (2013). The Determinants of Inflation in Botswana and Bank of Botswana's Medium-Term Objective Range. Botswana Journal of Economics*, 11*(15), 57-74.

Haque, N. U., & Qayyum, A. (2006). Inflation everywhere is a monetary phenomenon: An introductory note. The Pakistan development review, 45(2), pp. 179-183.

International Monetary Fund (2000). *Inflation Targeting in Practice: Strategic and Operational Issues and Application to Emerging Market Economies.* Retrived on 03.04.2018 from; https://www.imf.org/external/pubs/ft/seminar/2000/targets/strach1.pdf

Khan, R. E. A., & Hye, Q. M. A. (2013). Financial liberalization and demand for money: A case of Pakistan. The Journal of Developing Areas, 175-198.

Laidler, L. (1997). *Money and Macroeconomics; Selected essays of David Laidler.* UK: Edward Elgar Pub.

McCandless, G. T. Weber, W. E. (1995). Some Monetary Facts. *Quarterlt Review, 19*(3), pp. 2-11.

Moroney, J. (2002). Money Growth, Output Growth, and Inflation: Estimation of a Modern Quantity Theory. *Southern Economic Journal, 69*(2), 398-413.

Ndoricimpa, A. (2017). Threshold Effects of Inflation on Economic Growth in Africa: Evidence from a Dynamic Panel Threshold Regression Approach: African Development Bank Working Paper.

Qayyum, A. (2006). Money, Inflation and Growth in Pakistan. *The Pakistan Development Review, 45*(2), 203-212.

Ramsaran, R. (1992). Factors Affecting the Income Velocity of Money in the Commonwealth Caribbean. Social and Economic Studies, 41(4), 205-223. Retrieved from http://www.jstor.org/stable/27865122

Ritter, L.S., Silber, F.I., & Udell, G.F (1996). Principles of Money, Banking, and Financial Markets. 9 edition. Addison Wesley.

Rolnick, A. J., Weber, W. E. (1998). Money, Inflation and Output Under Fiat and Commodity Standards. *Quarterly Review*, pp. 11-17.

Schumpeter, J. A. (2017). Essays: on entrepreneurs, innovations, business cycles and the evolution of capitalism: Routledge.

Sekwati, L. (2008). An Analysis of the Stability of Monetary Aggragates in Botswana. *Botswana Journal of Economics*, 5 (7), pp. 2-13

Singh, J. (2010). *Money Supply- Meaning of Measures of Money Supply.* Retrieved on 11/02.2018 from; http://www.economicsdiscussion.net/money/money-supply-meaning-and-measures-of-money-supply/599

Washington, S. P., Karlaftis, M. G., & Mannering, F. (2010). Statistical and econometric methods for transportation data analysis: Chapman and Hall/CRC.