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Effect of Monetary Policy on Economic Growth in Ghana

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Abstract

This paper seeks to examine the role of monetary policy as an instrument for growth in the Ghanaian economy. The study was conducted based on yearly data from 1983 to 2017. Economic growth was the regressand in the study, with money supply, inflation, and the lending rate as the regressors. The ARDL bounds test technique was employed to investigate cointegration among the variables. The results confirmed the presence of cointegration among the variables. The results also showed the money supply as having a significant positive effect on growth in Ghana in the long run but a significant negative effect on growth in the short run. The lending rate however, was found to have an insignificant negative effect on growth in the long run but a significant positive effect on growth in the short run. Therefore, on the basis of the research findings, it is recommended that money supply be regulated in such a way that it does not lead to uncontrollable inflation, as inflation has a significant negative impact on economic growth at least in the short run, while persistent inflation in the long run is inimical to economic growth. It is further recommended that the lending rate be managed properly in order for investment to be accelerated to boost economic growth.

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1. Introduction

Several policy levers are employed by governments the world over for stabilization purposes. These are exchange rate, price, income, and supply-side policies. However, the most common observed policy levers are the monetary and fiscal policies. Whereas fiscal policy involves using taxes and government spending to stabilize the economy in the event of shocks, monetary policy entails the use of interest and money-supply policies by the central bank to stabilize the economy when there is a shock. According to the Bank of Ghana (2017), monetary policy is carried out when the central bank regulates the money supply and the policy rate in order to achieve specific goals such as a desirable level of inflation, a stable exchange rate, and economic growth. It is also considered as a thoughtful action by the central bank to regulate the amount, cost, and accessibility of money credit in order to achieve desired macroeconomic objectives (Central Bank of Nigeria, 2011). This is conducted through changing the monetary policy stance with a view to controlling the economy's cash in circulation.

In most economies, the monetary authority spearheaded by the central bank is the institution charged with the sole responsibility of carrying out monetary policy with the aim of affecting certain sensitive economic variables for the overall goal of maintaining price stability and output growth. Some schools of thought maintain that, it is important to follow the best policies to control inflation in order to achieve the desire level of growth at all cost. Quah and Vahey (1995) and Blanchard (2016) are among the proponents of this hypothesis. This idea explains why the central bank's autonomy is considered critical for regulating irresponsible fiscal policies and thereby enhancing growth. According to Frenkel and Johnson (2013) the proposal is revolutionary because it is an innovative paradigm for tackling both inflation and stagnation. The monetarists hold the view that monetary rather than fiscal policy is more potent for stabilization, while the Keynesians reject this proposition and made a strong case for fiscal policy (Khosravi & Karimi, 2010).

According to Anowor and Okorie (2016) and Precious (2014) monetary policy affects economic variables such as employment, inflation, GDP growth, and balance of payments (BOP) deficits in low-income countries. However, the effectiveness of monetary policy on the

macroeconomy depends on the mode of implementation and how free the central bank can be about choosing the appropriate tools to formulate the monetary policy (Alavinasab, 2016). Therefore, the central bank uses its available tools to manipulate the level of cash and interest rate in the banking industry for stability and economic growth. A very relevant question in this respect is whether the central bank's modus operandi in forecasting and policy implementation have occasionally been compromised, leading to missing policy targets. This shows the vital role that central banks play by addressing the disparities in the monetary system that adversely influence growth and employment. The central bank performs its roles by employing such tools as open market operations (OMO), the discount rate, and moral suasion, among others.

The Bank of Ghana (BOG) is responsible for conducting monetary policy with the main objectives of keeping inflation at acceptable levels and promoting the growth of the national economy (Bank of Ghana, 2017). In order to achieve these objectives, the BOG "Act 612" (2002) grants the bank the autonomy to determine policy rates and it is answerable to parliament. The rationale for granting the Bank autonomy is to ensure the Bank executes its functions without any external influence. It is deemed that alterations in the short-term policy rate and money supply (the BOG's main tools for stabilization) apparently lead to deviations in other rates and demand for money in the economy, which subsequently impacts all economic activities (Dagher & Kovanen, 2011). This would give the central bank the leeway to hit the interest target and control the supply of money in order to ensure price stability and manage people's expectations to achieve the government's objective of sustained growth and employment.

In Ghana, however, while the central bank is carrying out these responsibilities, we are daily witnessing a situation in which the very variables such as inflation, growth, employment, the exchange rate, and others—which the BOG can regulate—dominate public discussions in the country. For instance, the BOG inflation target is $8 \pm 2\%$ but there are occasions when this target is missed. This situation undermines public confidence in the Bank and raises questions as to whether these deviations represent a malfunction in the policy implementation process by monetary authorities, especially a central bank that is supposed to be autonomous and mandated to regulate inflation.

Indeed, Ghana lost policy credibility in 2015 with respect to these variables and had to approach the International Monetary Fund (IMF) to restore policy credibility. This formed the basis for the three-year Extended Credit Facility (ECF) program the country implemented until 2019.

Under this program, the IMF offered Ghana a bailout to the tune of \$918 billion to support the country's budget and, more importantly, the IMF was to assist the country to restore policy credibility, which had been lost at the time. Thus, the queries that arise are: Is monetary policy consequential to the stabilization of the Ghanaian economy? What is the magnitude of the impact of monetary policy on economic growth in Ghana? To answer these queries, a first-hand study is needed to identify whether monetary policy in the Ghanaian context plays a critical role as an instrument for growth and regulating inflation in Ghana, and this study seeks to achieve just that. Several empirical works have analyzed the effect of monetary policy on economic growth within and without Ghana.

To begin with, applying the ordinary least squares method on data from 1980 to 2012, Havi & Enu (2014) analyzed the effects of fiscal and monetary policies on Ghana's economic growth. The results revealed that monetary and fiscal policies affect growth positively in Ghana. The study prescribed that monetary policies pursued by the Bank of Ghana should result in a favorable investment environment via suitable stabilization of the economy

Further, employing the OLS approach, Ofori-Frimpon (2017) analyzed the impact of the money supply on inflation in Ghana using yearly data from 1967 to 2015. The findings showed a medium-run direct correlation between the money supply and inflation. It was therefore suggested that the money supply should be regulated properly in order to keep inflation at least close to the target.

Moreover, Quartey and Aful-Mensah (2014) appraised the current monetary and financial policies followed in Ghana. The research concluded that even though there exist marked advances in key monetary indicators suggesting relatively effective monetary policy for the period under review, the fiscal imbalance in the country has compromised these outcomes. The study therefore recommended greater fiscal discipline, considering that monetary policies cannot achieve their desired objectives in the face of fiscal imbalances.

In addition, Loria and Ramírez (2011) demonstrated through a Structural Vector Auto Regressive (SVAR) model on data from 1970 to 2008 that the monetary policy implemented in Mexico was by and large efficacious in decreasing core inflation at the expense of economic sluggishness.

Employing the OLS approach, Gul, Mughal, and Rahim (2012) established the nexus between monetary policy tools and growth for Pakistan. The findings showed that tighter monetary

policy with well-adjusted policy tools such as money supply, interest rates, and exchange rates have a direct correlation with growth. It was therefore concluded that monetary policy was critical for macro stability in Pakistan.

In the Ghanaian context, the literature thus far has not reflected modern developments in the connection between monetary policy and growth, and this research builds on the previous literature to cover this gap. This study therefore seeks to evaluate the following hypothesis statements:

H_0 : Monetary policy has no impact on growth in Ghana.

H_1 : Monetary policy has an impact on growth in Ghana.

2. Theorizing the effect of monetary policy on economic growth in Ghana

The study adopted the “quantity theory” of money and the liquidity preference theory to explain the effect of monetary policy on growth in Ghana. The classical economists were the first to deliberate on the concept of monetary policy, and the deliberation culminated in the formulation of the quantity theory of money (QTM) by Irving Fisher. This theory laid the groundwork for the nexus between monetary policy instruments and macroeconomic variables such as inflation and growth. In this framework, the velocity of money and productivity are presumed to be invariable over time, and thus any rise in the money supply will ultimately cause inflation in accordance with the predictions of the QTM (Twinoburyo & Odhiambo, 2018). According to Merkl (2008), “Money supply does not affect growth in the long run as money growth has both short run and long run neutrality.” Keynes disagreed with the quantity theory of money formulation, opining that it is based on unfounded assumptions such as the velocity of money being constant.

Keynesianism contended that prices are sticky at least in the short run and that money growth adjusts rapidly. The demand for money is not independent but dependent and is determined by the level of output and interest rates, as described in Keynes famous liquidity preference conceptualization (Twinoburyo & Odhiambo, 2018). Keynes further contended that three main motives exist for individuals’ desire to hold money: the transactionary, precautionary, and speculative motives. People prefer to hold money for daily expenses. How liquid one’s assets can be, however, is driven by the level of income, and a higher income implies more money is needed for business purposes. This is known as the transaction demand. Precautionary demand is the demand for money meant to minimize the risk associated with unforeseen contingencies such as

accidents and deaths. Money demand for purposes like this rises with the level of income, a clear link between growth and money demand. Speculative demand is that part of liquidity preference that occurs in response to changing interest rates. Keynes argued that the speculative demand for money is inversely related to the rate of interest, which means that a higher rate of interest attracts lower speculative demand for money and vice versa (Pigou, 1936).

The total import of Keynes' liquidity concept is that liquidity preference is negatively correlated with interest rates (Srithilat & Sun, 2017). In this framework, the interest rate is seen as the price of holding money, and at very low rates of interest, the economy enters the liquidity trap. A "liquidity trap" is described as the state in which the short-term nominal rate of interest is below the lower bound. In this case, many take the view that the nominal money supply has a neutral effect on output or prices. The "liquidity trap" is an idea by Keynes that contradicts the QTM, which maintains that price increases are strictly a function of nominal money supply (Friedman, 1971). Keynes particularly doubted the stabilization role of monetary policy, especially when the economy is within the "liquidity trap" largely due to situational indecision in the monetary markets. Keynes favored the role of fiscal policy over monetary policy at least at times when the economy is in the monetary trap (Twinoburyo & Odhiambo, 2018).

Figure 1 juxtaposes the inflation and money supply trends for the period under consideration. This is to enable the visualization of the movements among these variables over time, and it offers an opportunity to test the veracity of the famous QTM in the context of Ghana. Looking at the trends, of the two variables during the period under consideration, the proponents of the QTM seem vindicated in the case of Ghana, at least with the data from the 1970s to the 2000s. This is because the QTM asserts, as in the words of Friedman (1963, p.16), that "inflation is always and everywhere a monetary phenomenon" which implies that if the predictions of the QTM hold true, then money supply is the sole determinant of inflation in any economy. Looking at the trends of inflation and the money supply for the period under consideration with the data for Ghana, it is obvious from Figure 1 that these variables almost trend together and are most likely correlated. While correlation may not necessarily imply causation, we cannot rule out the possibility of cause-and-effect relationships, thereby vindicating the QTM in the Ghanaian context at least for the data from the 1970s through the 2000s.

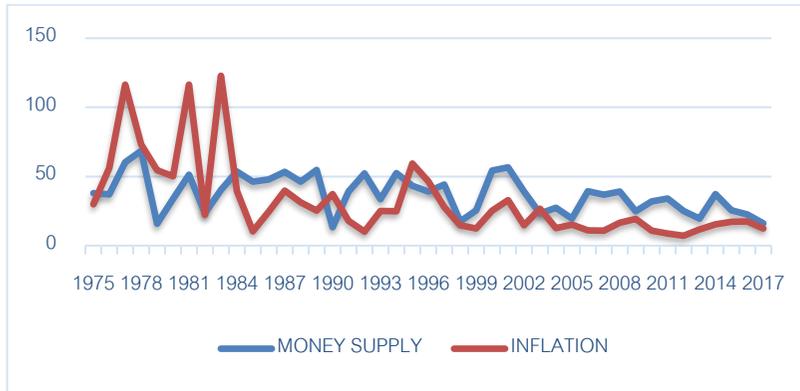


Figure 1. Trends in money supply and inflation in Ghana

Source: Authors' calculation

3. Methodology

The study seeks to analyze the relationship between monetary policy and real GDP growth. Real GDP growth constitutes the dependent variable, with monetary policy tools such as the lending rate and money supply as the main independent variables. The inflation rate was included based on the QTM's foundations of the study. Based on the stationary properties of the data, the Autoregressive distributed lag model (ARDL) is used to analyze the data and establish the effect of monetary policy as an instrument for growth in Ghana's economy. The generalized form of the ARDL (p, q) model is given by:

$$Y_t = \beta_{oi} + \sum_{i=1}^p \lambda_i Y_{t-i} + \sum_{i=0}^q \alpha_i X_{t-i} + \varepsilon_t \tag{1}$$

where Y_t is the dependent variable in our case, its RGDP, X_t is a vector of predictor variables with α_i as the vector of marginals of the predictor variables, p and q are the ideal lag lengths for the regressand and the regressors, respectively, and ε_t is the stochastic error.

To estimate both the short-run and long-run forms of the ARDL model based on the outcome of the bounds test, the model in (1) was extrapolated as follows;

$$\Delta RDGP_t = \alpha_0 + \sum_{i=1}^p \alpha_{1i} \Delta RGDP_{t-i} + \sum_{i=i}^q \alpha_{2i} \Delta \ln MS_{t-i} + \sum_{i=i}^q \alpha_{3i} \Delta LR_{t-i} + \sum_{i=1}^q \alpha_{4i} \Delta INFL_{t-i} + \lambda ECT_{t-1} + \varepsilon_t \tag{2}$$

where RGDP = Real Gross Domestic Product, MS = Money Supply, LR = Lending Rate, INFL= Inflation Rate, ln = natural log. The essence of the natural log transformation is to reduce a tenfold difference in values of the variables to twofold. It also allows us to interpret the coefficients of variables as direct elasticities. Equation (2) represents the operational form of the generalized

ARDL model specified in (1) with α_1 to α_5 as the short-run coefficients and λECT_{t-1} constituting the long-run representation in the model with λ as the error-correction term.

Table 1: Expected signs of the regressors

Independent variables	Expected signs
Money supply	+
Lending rate	-
Inflation rate	-

Since the study used time series data, it is germane to identify the stationary properties of the variables, for which reason the Augmented Dickey-Fuller (ADF) Unit root test approach is employed. This was applied to all variables to identify the order of integration so that the most appropriate estimation technique could be adopted to mitigate the danger of producing spurious and non-robust results (Ovat, 2016). The ADF test for stationarity is based on the null hypothesis that the series possesses a unit root, as opposed to the alternative hypothesis that the series is stationary. The decision rule is that the hypothesis of non-stationarity is rejected if the absolute value of the t -statistic is greater than the ADF critical value; otherwise, it is not rejected. The study also employed the bounds test approach to ascertain if there are some long-term relationships between the regressand and the regressors. The study further used the Breusch-Pagan Godfrey heteroscedasticity test to carry out the test for heteroscedasticity.

4. Results

Table 2 reports the results of the Augmented Dicky Fuller Unit Root test, and from the table, only real GDP, money supply, and the inflation variables at the 5% level are stationary at levels. Their stationarity is shown by the relatively high absolute values of their Augmented Dicky Fuller (ADF) test statistics. However, at the same level, the Lending rate appears to be non-stationary, as shown by its low ADF statistic. The implication is that at levels, we are having to deal with a mixture of variables with stationary and non-stationary properties, giving rise to the situation where the variables are integrated of orders zero $I(0)$ and one $I(1)$ at levels. The results also reveal that all the variables appear to be stationary at the first difference, as shown by the higher values of their ADF statistics. The overall conclusion from the ADF test is that applying a simple OLS to

estimate the variables under consideration could produce a spurious result, and this makes the Autoregressive Distributed Lag Model (ARDL) an ideal model for estimation.

Table 2: Augmented Dicky Fuller unit root test results

Variables	Levels	First difference
RGDP	-5.9641**	-9.8413**
LnMS	-3.8780**	-5.5343**
INFL	-8.1122**	-4.3928**
LR	-2.3128	-5.9661**

Source: Authors' calculation

Table 3 reports the results of the Autoregressive bounds test for cointegration between the variables. The hypothesis statements underlying this test are:

H_0 : The variables are not cointegrated.

H_1 : The variables are cointegrated.

From Table 3, the F-statistic of the test is 5.31, which lies outside the upper bound even at the 1% level, and this presents enough proof to reject the hypothesis of no cointegration and therefore to conclude that there are some long-run relationships between the regressand and the predictor variables. This suggests that the independent variables still explain variations in the regressand even in the long run.

Table 3: Autoregressive distributed lag bounds test results

Test Statistic	Value	K
F-statistic	5.31	4
Bounds	Critical Value	
Significance	10 Bound	11 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Source: Authors' calculation

Table 4 presents the long-run results of the ARDL model and from the table, the first variable, inflation (INF), is significant as the p -value of the variable is less than the 5% level. Its negative coefficient of -0.229 means that a percentage rise in inflation leads to an approximately 0.24% fall in real GDP growth in the long run. The negative coefficient of inflation is consistent with the a priori expectations of this study. This core finding is also consistent with the findings of Srithilat and Sun (2017) and Babatunde and Shuaibu (2011)

The second variable, the lending rate (LR), has a negative coefficient of 0.070 , which means a percentage rise in the lending rate is associated with about a 0.07% decrease in growth in the long run. This finding conforms to the a priori expectations of this research regarding the connection between the lending rate and real GDP growth in this study. The finding is, however, not statistically significant as shown by its high p -value in excess of 0.05. The finding is consistent with the findings of Gul et al. (2012, p. 73), albeit they found it statistically significant.

The last variable, the money supply (MS), which is one of the variables of interest, is significant at the 10% significance level and its positive coefficient of 0.28 implies that a percentage rise in the money supply is associated with a 0.28% rise in real GDP growth in the long run. This result is consistent with the a priori expectations of this paper and also consistent with the findings of Gul et al. (2012), Obeid and Awad (2017) and Ufoeze (2018). Money supply is a critical variable of interest as regards the connection between monetary policy and growth, and this finding would therefore mean that monetary policy is critical in deriving growth in line with the theoretical predictions of the QTM.

Table 4. ARDL long-run results

Variable	Coefficients	Std. Error	t -statistic	Prob.
INF	-0.229	0.069	-3.315	0.006
LR	-0.070	0.100	-0.697	0.498
LnMS	0.280	0.132	2.118	0.054
C	-21.245	20.264	-1.048	0.314

Source: Authors' calculation

Table 5 presents the short-run findings of the ARDL model. From the table, the first variable, inflation, has a negative coefficient of 0.073 , which implies that all things being equal, a

percentage rise in inflation leads to about a 0.073% fall in real GDP growth in Ghana, which is consistent with the a priori expectations of this study. This finding, however, appears to be statistically insignificant in affecting the growth of GDP in the short run since the p -value is higher than the 5% level. The finding that inflation does not significantly affect growth is consistent with the findings of Ruzima and Veerachamy (2016) and Hussain and Zafar (2018), who found that inflation impacts negatively on growth.

The findings further show that a monetary policy instrument such as the lending rate has an immediate positive impact on growth with a positive coefficient of about 0.11, which means a percentage increase in the lending rate results in about a 0.11% increase in growth in the short run. This finding is, however, not statistically significant and it is contrary to the expectations of this study. At lag (1), however, the lending rate maintains an expected negative relationship with growth but is also not statistically significant.

Moreover, the results indicate that the money supply at levels exert a positive effect on growth with a positive coefficient of 0.028, which means that holding all factors constant, a percentage rise in the money supply leads to about a 0.028% rise in output growth in the short run. This finding is consistent with the expectations of this study regarding the money supply. It is, however, not statistically significant as the p -value of the t -statistic far exceeds the 5% level. The QTM upon which this work rests postulates a direct association between money supply and growth. The results vindicate this positive correlation, although it is not significant. This core revelation about the direct relationship between the money supply, the core variable of this study, and growth is in line with the outcomes of a plethora of research such as Omodero (2019), Hussain and Zafar (2018), and Chaitip, Chokethaworn, Chaiboonsri, & Khounkhalax (2015), among others.

Table 5: Short-run coefficients

Variable	Coefficient	Std. Error	t-statistic	Prob.
D(INF)	-0.073	0.043	-1.722	0.109
D(LR)	0.109	0.056	1.949	0.073
D(LR[-1])	-0.120	0.089	-1.352	0.199
D(LR[-2])	0.274	0.080	3.411	0.005
D(MS)	-0.028	0.033	0.849	0.411
D(MS[-1])	-0.083	0.037	-2.266	0.041
D(MS[-2])	-0.007	0.035	-0.212	0.835

ECM(-1)	-0.816	0.178	-4.581	0.001
ECM = RGDP-(0.229*INF -0.069*LR + 0.280*MS -21.245)				

Source: Authors' calculation

5. Key Findings

The study found the presence of long-run associations between the regressors and the regressand. The study also found the existence of significant long-run and/or short-run associations between monetary policy instruments and real GDP growth in Ghana. It shows that the money supply has a significant direct effect on growth in Ghana in the long run, and it also positively influences growth in the short run, although it is statistically insignificant. In addition, the study found that the lending rate, which is also a monetary policy variable, has an insignificant negative long-run correlation with real GDP growth at the 5% level. Moreover, the inflation rate appears significant at the 5% level in the short run, with an expected inverse effect on growth both in the short run and the long run, although it is significant in the short run. The model used for estimation being an ARDL model, the results present an ECM coefficient of -0.815899, which means that the dependent variable returns at a speed of about 80% to equilibrium, following shocks in the short run.

6. Conclusions and recommendations

This study analysed the effect of monetary policy on the growth of the Ghanaian economy using yearly data from 1983 to 2017. The significant positive effect of the money supply on growth suggests that an appropriate application of monetary policy has the potential of delivering a sustained level of growth in the Ghanaian economy. The government should therefore grant the central bank the autonomy to implement effective policies that will make monetary policy an anchor for development in Ghana. Further, the rate of growth of the money supply must be structured in a manner that does not lead to uncontrollable inflation, as inflation has a negative effect on growth at least in the short run, while persistent inflation in the long run is unfavorable to growth. This is due to the key postulation in the QTM that excess money supply could lead to inflation.

Moreover, inflation was identified as having a significant negative effect on growth in Ghana. This suggests that rising inflation adversely affects economic growth and hence

distorts the price system. Therefore, enough attention should be placed on reducing inflation to some reasonable level by the monetary authority of the country in order to prevent its dire consequences. The study further recommends a more robust management of the lending regime because the results indicate that the lending rate at lag (1) affects growth negatively, and therefore keeping the lending rate at reasonable levels will go a long way towards promoting investment and thereby bring about growth at least in the short run.

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