

## What effect does the Monetary Policy of Ghana have on the country's GDP growth? From 1980 to 2015, a retrospective time series analysis



Dr. Patrick K Ansah

**ABSTRACT:** Using data for the annual period series from 1980 to 2015, this article explores the impact of the Bank of Ghana's monetary policy and whether it has a major impact on Ghana's economic growth. The study used the Ordinary Least Square (OLS) retrieval line model, and the retrospective analysis was done using the SPSS statistical software with F-Statistic and T Statistic. GDP was a model-dependent variable in this study, while income, interest rate, and inflation were independent / descriptive variables. The findings showed that at 5% significant level, both interest rates and income were statistically insignificant, while inflation was statistically significant at 5% level, in that, a 1% increase in inflation resulted in a 6.9% drop in GDP. The impact of inflation on GDP has been negative. Fisher (1993), Ghosh and Philips (1998), and Neil (1999) are examples of similar verified investigations (2000). The corrected R<sup>2</sup> value of 0.365 clearly reveals that the Bank of Ghana's overall banking policy contributed roughly 36.5 percent to economic growth, whereas other unnamed factors accounted for a large difference in GDP of 65.5 percent. As a result, my policy advice is that the Ghanaian central bank employ suitable monetary policy tools to better control inflation and decrease it to a single digit, as well as pay attention to details in other real economic sector indicators to raise the rate of growth. Information on the Bank of Ghana's (BOG) overall financial strategy on policies that contribute to economic stability, Same should be made available to the Ministry of Finance and Economic Planning (MOFEP) and industry stakeholders.

**KEYWORDS:** GDP, Inflation, Interest Rate, Monetary Policy, income

### 1.0 BACKGROUND

According to the Federal Reserve Board (Federal Reserve Board, 2006), monetary policy is the process by which a country's financial authorities (the Central Bank) govern the production and distribution of money, typically by guiding interest rates to promote economic growth and stability. (Khan, 2010) also noted that many emerging countries have adopted flexible exchange principles, resulting in more monetary policy, because in a cohesive globe, there is less time to adjust to shocks and a greater need for close economic integration between trading partners Since the government of Ghana introduced the Recovery Plan (ERP) in 1983, Ghana's monetary policy has altered considerably in response to developments in the financial system. The goal of monetary policy, according to (ISSER, 1997), was to stabilize prices and enhance domestic Gross Domestic Product (GDP) through establishing a hospitable and unified business climate for private and public sector investment in Ghana. The total amount of products and services generated in an economy (for example, within the four walls of Ghana) over a period, say one year, is known as Gross Domestic Product (GDP) (Paragon, 2001).

He also mentioned in (Addison, 2001) that monetary policy tools and indirect market-based tools have been developed. The policy objectives, which are the values of specific economic dynamics sought by the financial regulator to profit from monetary policy, continue to have a comprehensive financial provision that will drive GDP growth. New financial assets emerging from freedom and the innovation process have been incorporated into the definition of financing, and they have served as proximity to financial assets. Since the ERP / SAP (Structural Rehabilitation Program), the results of numerous policy measures in Ghana have been uneven. The requirement to satisfy unforeseen financial needs has been a major impediment to monetary policy for much of the review period. In addition, since 1994, financial management has been highly burdened by end-of-year inflation targets, particularly with the influx of foreign loans set aside for cork purchases, causing GDP disruption.

### 1.1 Statement of the Issue

According to (Khan and Abdulrahman2010), while domestic government borrowing was cut in real terms and private sector financing remained very low, revenue growth in the second half of the 1980s and 1990s increased in emerging countries and Sub-

## **What effect does the Monetary Policy of Ghana have on the country's GDP growth? From 1980 to 2015, a retrospective time series analysis**

Saharan African countries such as Ghana. in those periods, resulting in any rate of GDP growth, as seen in (Aryeetey et al, 1994). According to statistics from (ISSER 1999), expenditure has climbed by 25% and 24%, respectively, since 1999. (ISSER, 2002) also had a budget increase and a wide variety of over-the-counter income targets ranging from over one hundred percent (100%) to forty-six percent (42.6%) and fifty percent (50%). (50 percent). In 2002, the average percentage change in GDP was eighty-two percent (82 percent)

The key issue here is that financing has gradually increased without showing any proportional impact on GDP development in the Ghanaian economy during the research period, and this necessitates research, which is why this article is needed.

### **1.2 Learning Objectives**

The goal of this research is to determine the impact of the Bank of Ghana's monetary policy on economic activity in Ghana. Examining the influence of financial policy tools such as the Discount Rate, Open Market Operation (OMO), and Cash Ratio on Ghana's economic activity, as well as their impact on GDP, interest rates, and inflation, as utilized by the Bank of Ghana.

#### **1.2.1 The Overarching Goal**

The study's major goal was to determine the influence of monetary policy on Ghana's economic activities.

#### **1.2.2 Objectives Specifics**

The following are the study's particular goals: -

- (i) Examining the BoG's monetary policy tools for achieving Ghana's GDP.
- (ii) Analyzing the impact of interest rates and inflation on Ghana's GDP.

### **1.3 Hypothesis for research**

- (a) HO: Funding has no discernible effect on Ghana's economic growth.  
H1: Funding has a significant impact on Ghana's economic development.
- (b) HO: Inflation has had little impact on Ghana's economic development.  
H1: Ghana's economic growth is severely hampered by inflation.
- (c) HO: Interest rates have little impact on Ghana's economic development.  
H1: The impact of interest rates on Ghana's economic growth is significant.

## **2.1 Theoretical Foundation**

Under the direction of the World Bank and the International Monetary Fund, the government launched the Economic Recovery Program (ERP) in 1983. (IMF). One of the motivations for establishing ERP was to reduce inflation rates through strict monetary regulations and to increase the flow of foreign cash into the Ghanaian economy and steer it to key sectors in order to enhance economic activity. The ERP took a market-oriented strategy to addressing microeconomic imbalances and liberalizing the external sector, and made significant success. Inflation has been a prominent topic of controversy in the Ghanaian economy, and despite a large decrease from the pre-reform era, inflation remains high. According to ISSER (2005), an increase in monetary aggregates is one of the drivers of inflation in Ghana (money supply). Inflation is created by a rise in the money supply, according to Milton Friedmann (1963), and if the money supply were grown at the same rate as real GDP, inflation would disappear.

### **2.1.1 Cash**

Money is anything that is commonly accepted as a means of exchange and a measure of worth between commodities and services in the discharge of business responsibilities. Inflation is a primary source of money value variations over time. The quantity of products and services that a unit of money can purchase determines its value. During periods of inflation, a unit of money can buy fewer products or one must give up more money to get the same number of goods as previously (Paragon, 2001).

### **2.1.2 Monetary Base**

The entire amount of monetary assets accessible in an economy at any given time is known as the money supply. The government, usually through GSS or BoG, records and publishes data on the money supply. Because of its influence on the overall price level, the exchange rate, and the business cycle, public and private sector analysts have long tracked variations in money supply throughout time (Paul M. Johnson, 2005).

- (i) The money supply is typically divided into three categories: M1, M2, and M3.
- (ii) M1 = Cash (Coins and Bills) and Deposits in Checking Accounts.
- (iii) M2 = M1 + Savings Account Deposits.
- (iv) M3 = M2 + Time Deposits

## **What effect does the Monetary Policy of Ghana have on the country's GDP growth? From 1980 to 2015, a retrospective time series analysis**

(v) M0 stands for basic money, also known as high-powered money, which refers to the amount of money issued by the central bank.

The specific items that make up an economy's money supply are determined by the definition of money supply used. M1 is a restricted definition of money supply. This is made up of two components: currency in circulation (paper notes and coins) and demand deposits (current accounts) with banks. All goods in M1 plus certain liquid assets or near monies — savings deposits, money market funds, and so forth — make up the broadly defined money supply (M2).

Money has a significant impact on economic activity since it is employed in almost all economic transactions. A rise in the money supply stimulates expenditure by lowering borrowing rates, which encourages investment, and by placing more money in the hands of consumers, making them feel wealthier. Increased revenues prompt companies to order additional raw materials and boost production. The spread of company activity boosts labor demand while also boosting capital goods demand. Stock market prices rise in a growing economy, and companies issue equity and debt. Prices begin to rise as the money supply expands, especially if output growth meets capacity constraints. As the public expects inflation (a sustained and significant increase in the general price level in an economy without a commensurable increase in productivity), lenders demand higher interest rates to compensate for the predicted loss of buying power over the loan's term. When the money supply or the pace of growth of money diminishes, opposite effects emerge. Disinflation (a slowing of the inflation rate) or deflation (a reduction in the general price level of goods and services) occurs as economic activity slows. Anna J Schawtz (Anna J Schawtz, 1960).

The easiest way to gauge a country's wealth is to look at the commodities and services it produces. The amount of money in the economy has no effect on the price of goods. Because prices determine what enterprises create and when they produce it, and customers determine what they buy, unexpected changes in the overall price level can knock an economy off of its stride. People buy less when there is a lot of inflation, which impacts businesses, which affects employees, and so on, because wages are sticky upwards. People buy less as a result of deflation because they wait for prices to drop even further, and lower prices, of course, make it more difficult for enterprises to stay afloat (Hannah, 2008).

### **2.1.3 Monetary Policy and the Central Bank**

A central bank is an organization that oversees the currency, money supply, and interest rate of a country. Central banks are usually in charge of their countries' commercial banking systems. A central bank, unlike a commercial bank, has a monopoly on growing the amount of money in the country and usually produces the national currency, which acts as the country's legal tender (Steven M. Sheffrin, 2003).

In almost all countries, the central bank performs the following important functions:

- (i) Issuing notes and controlling the amount of money in circulation
- (ii) Serves as the government's banker
- (iii) Serves as a banker for banks.
- (iv) Serves as keeper of the nation's reserves
- (v) Serves as a last-resort lender
- (vi) Serves as a clearinghouse for national information (vii) Serves as a credit controller.

Monetary policy aims to influence the economy's economic activity primarily through two major variables: money or credit supply and interest rate (Aparajita Sinha, 2012).

The central bank, referred to as the BoG in this study, has some tools at its disposal for controlling the money supply, which has an inextricable impact on the macro economy. The three most important tools are:

I Rate of Discount

- (ii) Operation of an Open Market (OMO)
- (iii) Required Reserve Ratio or Cash Ratio

The discount rate is the rate at which commercial banks and other depository institutions can borrow reserves from the Central Bank. Typically, this rate is set lower than short-term market rates (T-bills). This allows institutions to change credit conditions (i.e., the amount of money they can lend out) and thus influence the money supply. The Discount Window is the one instrument over which the Central Banks do not have complete control.

The Central Bank's open market activities are simply the purchasing and selling of government bonds on the open market. The consequence of the Central Bank buying bonds is to boost the money supply and so lower interest rates; the opposite is true if bonds are sold. Due to its ease of use, this is the most extensively utilized device in the day-to-day control of the money supply. Reserve requirements are a percentage of commercial banks' and other depository institutions' demand deposit liabilities (i.e.

## **What effect does the Monetary Policy of Ghana have on the country's GDP growth? From 1980 to 2015, a retrospective time series analysis**

chequing accounts) that must be held on deposit with the Central Bank under Banking Regulations. Although it is rarely used, the Central Bank can adjust this proportion at any time, affecting the money supply and credit conditions. If the reserve requirement percentage is raised, it will diminish the money supply by requiring the Central Bank to hold a larger percentage of banks' and depository institutions' demand deposits, thereby removing them from circulation. As a result, an increase in reserve requirements would raise interest rates since borrowers would have less currency available. This type of action is only carried out on rare occasions since it has a significant impact on the money supply. Changing reserve requirements is a long-term adjustment in the money supply, not just a short-term remedial action (Ronnie, 1998).

### **2.1.4 Gross Domestic Product (GDP) (GDP)**

GDP (O'Sullivan, 2009) is the market value of all officially recognized final goods and services produced inside a country over a certain period. GDP is divided into two categories: - gross domestic product (GDP) at factor price and - gross domestic product (GDP) at market price There are two types of GDP: nominal and real.

The nominal GDP is calculated at today's prices. As a result, nominal GDP would incorporate any changes in market prices caused by inflation or deflation during the current year. Another measure, Real GDP, is presented to abstract changes in the overall price level by evaluating market prices using a base year (O'Sullivan, 2009).

Consumption, investment, government expenditure, import and export are all variables that must be included in the computation of real GDP.

$GDP = C + I + G + (X-M)$  WHERE:

C = Household expenditure on durable and non-durable goods and services is referred to as personal consumption expenditure.

I = Gross domestic private investment, i.e. Fixed investment in a business, such as plant and machinery. All types of construction, including commercial and residential structures, as well as inventory modifications.

G = Government purchases of final goods and services include central government defense spending, government employee pay and salaries, and other spending on and by local governments. All government transfer payments, however, are excluded because they do not reflect current production.

Exports of products and services minus imports of goods and services equals  $X-M$  =Net Exports.

### **2.1.5 The Monetary Policy Framework of the Bank of Ghana (Objectives, Targets and Instruments)**

The Bank's monetary policy goal is to maintain price stability and low inflation while also supporting the government's economic goals, such as growth and employment. The government's inflation target defines price stability. This goal is updated every year and spelled out in the budget statement for each fiscal year. The object recognizes the importance of price stability in attaining overall economic stability, as well as in creating the necessary conditions for long-term output and employment growth. The Bank of Ghana Act of 2002 gave the bank the authority to determine interest rates on its own. The Bank is answerable to both parliament and the larger public larger (Ghana Statistical Bulletin, 2002).

Price stability, growth, full employment, smoothing the business cycle, preventing financial crises, and stabilizing long-term interest rates and the real exchange rate have all been traditional monetary policy objectives. Although some objectives are consistent with each other, others are not; for example, the objective of price stability often conflicts with the objectives of interest rate stability and higher short-run employment (Fischer, 1993). (Fischer, 1993). As a result, countries may give equal weight to these goals or place a larger focus on the goal of low inflation. This recent shift was prompted by significant empirical evidence that high inflation (and its associated high variability) affects private agents' investment, savings, and output decisions, resulting in slower economic growth (Khan and Senhadji, 2001).

Monetary policy is a means to an end, not an end in itself. It entails the management of money and credit in order to progress the government's general economic policy and achieve predefined goals. Varied countries have had different monetary policy objectives at different times and under different economic conditions.

These goals conflict with one another, making it difficult to choose the best goal for a country's monetary policy. The proper monetary policy objective should be chosen by the monetary authority in light of the economy's specific conditions and requirements. -Monetary neutrality, price stability, economic growth, exchange stability, and full employment are some of the aims or goals of monetary policy (D.C Woran, 2012).

Price stability is one of the five objectives of economic policy, along with economic development, full employment, and internal and external balance. The duty for achieving and maintaining price stability has been delegated to central banks as part of the division of labor among economic policymakers. Fiduciary or paper money is issued by the Central Bank on the basis of computation of expected demand for cash. Monetary policy guides the Central Bank's supply of money in order to achieve the objectives of price stability (or low inflation rate), full employment, and increase in aggregate income. Money is a means of

## **What effect does the Monetary Policy of Ghana have on the country's GDP growth? From 1980 to 2015, a retrospective time series analysis**

exchange, and changes in its demand compared to supply imply spending adjustments. In order to execute monetary policy, the Central Bank adjusts some monetary variables that it controls, such as the monetary aggregate, the interest rate, and the exchange rate, in order to effect goals that it does not control. The Central Bank's monetary policy instruments are determined by the economy's stage of development (Benjamin Friedman, 1998)

Almost since the subject's inception as a recognized branch of economic investigation, the goal to provide normative guidance to public policy has been a central concern in monetary economics. It's easy to see how the two are linked. Because "money" is a commodity provided by the government or, at the very least, by the private sector under government authority and conditions, the link between monetary influences on economic activity and specific actions by identifiable public institutions is immediate and direct. Investigating how such public institutions' actions affect the principal characteristics of macroeconomic activity has always formed the crux of what monetary economics is all about. As long as some macroeconomic outcomes are plainly better to others—stable prices rather than inflation, for example, or prosperity rather than widespread unemployment. The question of what government policies are more likely to lead to more desirable outcomes is not only natural but inevitable. The research on monetary policy aims and instruments has grown in response to a desire to bring monetary economics closer to central bank activities (Benjamin Friedman, 1988).

Monetary policy targets are the values of specified economic variables that the central bank aims to accomplish through monetary policy. Interest rates, monetary aggregates, and exchange rates are the three most well-known monetary policy aims. These are frequently intermediate goals that can be reached quickly and easily quantified, but that eventually lead to the macroeconomic goals of full employment, stability, and economic development (ISSER, 2007). Operating and intermediate aims are the two types of monetary policy targets.

Intermediate targets are variables that influence monetary policy's ultimate goals but are not directly controlled by the central bank, whereas operating targets are tactical goals that the central bank can influence in the short term (Khan and Senhadji, 2001). Identification of acceptable intermediate aims, operating targets, and/or policy instruments in Ghana is a key requirement of the activity, which has been a topic of debate among economists. They also noted that throughout the reform period in Ghana, the monetary policy framework was monetary aggregate targeting, and the monetary authority had terrible time trying to reach targets (Dordunno and Dunkor, 1997). (Dordunno and Dunkor, 1997).

According to (Fisher, 1993) data indicates that inflation decreases growth via lowering investment and productivity growth. He further emphasizes that, low inflation and small budget deficits are not necessary for high growth even over lengthy periods; conversely, high inflation is not consistent with prolonged economic expansion. Using a large panel dataset encompassing the IMF, (Ghosh and Phillips, 1998) discovered that inflation and growth are positively associated at very low inflation rates (less than 2-3%). At high levels of inflation, however, they are inversely connected. Similarly, the empirical findings of (Nell, 2000) imply that inflation in the single digits is advantageous, whereas inflation in the double digits appears to stifle growth. Inflation in the double digits, according to (Bruno and Easterly, 1996), appears to hinder growth. At yearly inflation rates of less than 40%, they similarly find no evidence of a link between inflation and growth. They discover a negative relationship between high inflation (over 40%) and growth in the short to medium term. Furthermore, they claim that discrete high inflation crises have no long-term impact on growth because countries tend to recover to their pre-crisis growth rates.

BOG employs a range of both direct and indirect methods to impact monetary policy. The indirect or market-based instruments typically entail open market operations and the use of a policy interest rate, whereas the direct instruments mostly involve use of the statutory reserve requirements. From time to time, the Bank also deploys special facilities to absorb excess liquidity from the financial system. Direct instruments function according to regulations granted to the central bank that directly affect either the interest rate or the volume of credit, which become increasingly ineffective as money and financial markets develop; besides, they create distortions, including financial repression, and promote financial disintermediation, and fiscal dominance (Fischer, 1993). (Fischer, 1993). Indirect instruments are also named "market-based instruments," since their use influences the market-determined price of bank reserves as the central bank engages in transactions with both financial and non-financial firms. There are three basic types of indirect instruments—open-market operations, central bank lending policies, and reserve requirements—that are used to inject and absorb liquidity (Fischer, 1993).

(Fischer, 1993). "In developed countries, monetary and financial policy play a major direct and indirect role in government efforts to expand economic activity in times of unemployment and excess capacity (economic recession), and to contrast that activity in times of excess demand and inflation," according to (Todaro, 1977). The aggregate supply of money in circulation and the level of interest rate are the two main economic factors that monetary policy is based on. The supply of money (basically currency in circulation plus commercial bank deposits) is thought to be directly related to economic activity in the sense that a larger money

## **What effect does the Monetary Policy of Ghana have on the country's GDP growth? From 1980 to 2015, a retrospective time series analysis**

supply encourages people to buy more goods and services. This is what the so-called monetary theory of economic activity is all about.

Its adherents say that through controlling the expansion of money supply through central bank operations, governments may regulate their nation's economic activity. In contrast Keynesian contend that an enlarged volume of money in circulation enhances the availability of loan-able funds. A supply of loan-able funds more than demand leads to reduced interest rates. Since private investment is thought to be inversely related to prevailing interest rates, businessmen will boost their investment as interest rate falls".

### **2.2.1 An Overview of Ghana's GDP Growth**

During the 1980s, the Ghanaian government effectively rebuilt important economic sectors that had deteriorated since the 1960s. Ghana's GDP increased during the decade, and part of its economic infrastructure was repaired. Because of a reversal in the previous decade's progressively dropping production, Ghana's economy grew at a rate of approximately 6% per year. The worst years for Ghana were 1982 (-6.9%) and 1983 (-4.6%), when the country saw the worst drought in fifty years, crop destruction from bush fires, and the lowest cocoa prices in the postwar period. In the mid- and late-'80s, GDP increased to 8.6% in 1984, before falling to 5.1 percent in 1989. With the return of cocoa, gold, and timber exports in the early 1990s, the export industry regained some vigor. According to government estimates, real GDP growth in 1993 was 6.1 percent, including a rebound in cocoa production and an increase in gold production. Ghana's GDP did not incur any negative effects from 1990 to 2000, as it stayed positive throughout the decade. In the mid-1990s, GDP was 4.1 percent, and from 1995 and 1999, it varied between 4.1 and 4.4 percent. Between 2001 and 2010, Ghana's GDP grew at an annual rate of 8.4%, the highest it has ever been.

### **2.2.2 An Overview of Ghanaian Inflation**

During the 1980s, ERP policies resulted in relatively high inflation rates. Foreign loans, particularly from the IMF, were used to fund the majority of ERP projects. During this time, the government depreciated the country's currency several times in order to raise producer prices for exports and encourage output, but depreciation also resulted in price increases for all other items. Because of the policies, inflation reached new highs of 116.5 percent in 1981 and 122.8 percent in 1983. Sustaining inflation at these low rates proved problematic in subsequent years, however, as between 1986 and 1990, the year on year rate of inflation was reportedly in the range of 19-46 percent; over the same period, average inflation was between 25 and 40 percent per annum, far exceeding official targets set within the ERP. The recorded rates of inflation in 1991 and 1992 were significantly lower than the much higher rates recorded in the mid-to-late 1980s. In 1992, average inflation was lowered to single digits, owing partly to good crops the previous year and deliberate monetary management initiatives. These efforts, however, were short-lived, as average inflation increased by more than a quarter to 25% per year in 1993 and 1994. The underlying inflationary pressures maintained over the next two years, with the economy seeing the greatest rates of inflation since the ERP began. The annual rate of inflation more than doubled from 24.9 percent in December 1994 to 74.3 percent in December 1995, bringing the overall rate from 24.9 percent to 59.5 percent. The official figures indicates that inflation at end-December 2000 almost tripled to 40.5 percent, compared with 12.4 percent for the same month of 1999 (Lawrence K. Apaloo, 2001). (Lawrence K. Apaloo, 2001). Ghana has regularly witnessed high rates of inflation – the recent ones being in 1999-2000 and 2002-2003. External shocks, unsustainable macroeconomic policies, and exchange rate depreciation have all contributed to this. All of these elements are present in the current situation, which has been in place since the fourth quarter of 2007. Indeed, other than the year 2005, controlling money supply growth has been challenging – in both the monetary base control period of 2000 and 2004 and the latter period of inflation targeting of 2006 to 2008. In 2010, inflation was 10.7 percent viewing it as one of the lowest years of inflation in the preceding 30 years.

### **2.2.3 An Overview of Money Supply in Ghana**

Control of money-supply growth and liquidity management have been among the government of Ghana's most difficult duties, and expansion has generally surpassed expectations for most of the 1980s. The original phase of monetary policy 1983 (49.3 percent) -1986 (44 percent) concentrated on lowering government borrowing from the domestic banking sector and on imposing quantitative controls via credit limitations. Although they succeeded in curbing domestic credit growth, bigger than expected overseas revenues and the money market's failure to process them efficiently contributed to a rapid expansion in the broad money supply until the late 1980s. The subsequent adoption of more dynamic monetary policies in 1989 involved a phase-in of indirect controls and market-based policy instruments. In 1990, a new set of measures was implemented to improve interest rate responsiveness to changes in liquidity conditions. By mid-1991, the Bank of Ghana's rediscount rate had risen from 26% to 35%, and three- and five-year instruments had been introduced, as well as a broadening of access to Bank of Ghana financial

## What effect does the Monetary Policy of Ghana have on the country's GDP growth? From 1980 to 2015, a retrospective time series analysis

instruments in favor of the non-bank financial sector. Money supply growth was firmly controlled in 1990 (10.8 percent) and 1991 (7.7%); but, a drop in interest rates and monetary control, exacerbated by public sector compensation increases, encouraged monetary expansion in 1992. (53 percent). (County studies, Library of Congress, 1994). Money supply ranged between 14 percent and 49.96 percent between 2001 and 2010. According to (A. Sanusi, 2010), fiscal deficit financing was the primary driver of the money supply process until the mid-1990s. However, in recent years, fluctuations in the Bank of Ghana's Net Foreign Assets, driven mostly by foreign aid and remittance inflows, appear to have been the primary source of monetary expansion.

### 2.2.4 An Overview of Ghana's Interest Rates

Interest rates throughout the 1980s were negative, ranging from -24.4 percent in 1980 to -8.2 percent at the end of the decade. Interest rates remained negative between 1990 and 2000, until they reached a high of 27 percent in 2001. Since then, the interest rate has been ranging between 16.83 percent and 25.62 percent, never falling below zero.

### 2.3 Final thoughts

(Milton Friedmann, 1968), asserts that Control over money supply is a key weapon of monetary policy. One of the aims of the monetary policy is to enhance the real GDP and growth of an economy balancing the price increase. Inflation always increases when the money supply growth surpasses the expansion of the economy for a period. Money supply is required to finance an economy's monetary expansion. Monetary growth is linked to an increase in money demand, which can occur as a result of an increase in real GDP or an increase in monetary phenomena in an economy.

The instruments available to the Bank of Ghana to meet its numerous objectives can be classified as outmoded and ineffective (the discount rate and reserve requirements), dependent on external circumstances when they are effective (foreign exchange operations), or rife with uncertainty about their effectiveness when either of these two conditions do not apply (Curtis E. Youngblood, 2000). (open market operations). The BOG has been able to regulate the rise of high-powered money, and hence the money supply, and thus bring the inflation rate down for brief periods of time. However, the country's overall monetary management record is weak, resulting in an uncertain macroeconomic climate and a decline in international competitiveness.

#### The Model (3.1)

Because this study deals with relationships between variables, the Ordinary Least Squares method (OLS) was used. Growth rate remains the dependent variable while Interest rate, Inflation rate and Money supply are the independent factors.

$$\text{Equation 1:- } GDP = \beta_0 + \beta_1 MSI + \beta_2 I + \beta_3 INFL + \mu$$

GDP-Gross Domestic Product  $\beta_0$  - This is the constant term.

$\beta_1$  -The slope coefficient that needs to be calculated

MSI- Money Supply also known as the control variable

I- interest rate

INFL - inflation

$\mu$  -is the stochastic error term that reflects the amount by which an observation departs from its predicted value.

To measure the percentage change (elasticity) of the dependent variable for every one percent change in the independent variable, the Ln would be introduced into equation 1. As a result, the Ln measures percentage changes in both dependent and independent variables. After the inclusion of Ln, the OLS model would be: -

$$\text{Equation 2:- } \ln GDP = \beta_0 + \beta_1 \ln MSI + \beta_2 \ln I + \beta_3 \ln INFL + \mu$$

The research GDP represents the dependent variable whose value will be decided by money supply.

An Independent variable is a variable that is handled by the researcher and assessed by its measurable effect on the dependent variable or variables (Mosby, 2009). (Mosby, 2009). Money supply, Interest Rate and Inflation are the independent variables whose value is not impacted by changes in the values of GDP.

Furthermore, is the intercept or constant term which reflects the value of GDP when money supply is equal to zero?

Is a parameter of the model and it's a quantity to be estimated? Is the money supply slope coefficient, which indicates the amount by which GDP will vary if the money supply grows by one percent and all other factors remain constant?

The Stochastic or Random Error Term refers to the fact that, in addition to the variation in GDP produced by the availability of money, there is always variation from other sources. This variation is due in part to explanatory variables that have been left out.

### 3.1.1 Information Sources

The information came from a BOG secondary data source. The annual GDP percentage growth rate and percentage changes in the money supply were utilized as time series data (from 1980 to 2015). The annual GDP percentage growth number in this study is

## **What effect does the Monetary Policy of Ghana have on the country's GDP growth? From 1980 to 2015, a retrospective time series analysis**

calculated at the end of each year and covers the years 1980-2015. Institute of Statistical, Social, and Economic Research (ISSER) and Ministry of Finance Economic Planning publications were also utilized (MOFEP).

### **3.1.2 Techniques and Data Analysis**

The relationship between Ghana's money supply, inflation, and exchange rate was studied using the Social Sciences (SPSS) version 20 software.

### **3.1.3 The t-test Decision Rule and the Critical t-value**

I used a critical t-value to determine whether or not to reject a null hypothesis based on a calculated t-value. The value that distinguishes the acceptance zone from the rejection region is known as a critical t-value (Gujarati, 2006).

The crucial t-value will be chosen from a one-side t-table based on the stated level of type one error (rejecting a true null hypothesis) and degrees of freedom, which are defined as the number of observations minus the number of estimated coefficients (including the constant term).

It is written mathematically as.

$$df = N - K - 1$$

Where; N is the number of observations

K is the number of coefficients estimated

1 represents the constant term

However, the type one error in this hypothesis test is called the level of significance. It indicates the probability of observing an estimated t-value greater than the critical t-value if the null hypothesis were correct. It also measures the amount of type one error implied by a particular t-value (Koutsonyiannis, 1973).

The degree of significance, on the other hand, is the type one error in this hypothesis test. If the null hypothesis is valid, it represents the likelihood of seeing an estimated t-value greater than the crucial t-value. It also determines how much type one mistake is implied by a given t-value (Koutsonyiannis, 1973).

Furthermore, the computer's likelihood will be compared to a relevant 5% threshold of significance calculated using a one-sided t-table. If we know the calculated t-value and the critical t-value, we reject the null hypothesis if is bigger in absolute value than and has the sign predicted by the alternative hypothesis (Gujarati, 2006).

### **3.1.4 The Decision Rule and the F-test of Overall Significance**

Although the unadjusted and adjusted R<sup>2</sup> measures an equation's overall degree of fit, they do not provide a formal hypothesis test of the overall fit. As a result, the F-test would be employed to see if the independent factors explain the variation in the dependent variable. The F-test is a formal hypothesis test for dealing with a null hypothesis containing numerous hypotheses or a single hypothesis concerning a set of coefficients (Gujarati, 2006).

The computer would generate the calculated F-value value.

At a 5% level of significance, the critical F-value will be calculated using statistical tables. We conclude that the explanatory variable(s) are jointly significant in explaining the dependent variable if the probability ratio is smaller than at the 5% significance level.

If the probability ratio is bigger than the relevant significant level of 5%, however, we infer that the factors do not together explain the dependent variable (Gujarati, 2006).

In addition, the Durbin-Watson (DW) d-statistic would be employed to determine whether autocorrelation exists. According to Gujarati (2006), the Durbin-Watson (DW) d-statistic examines the residuals of a particular estimation of the regression equation to identify if there is a first order serial correlation in the error component of the regression equation described above. Statistical Program for Social Sciences (SPSS) version 20 provides the DW d-statistic.

Finally, the coefficient of determination (R<sup>2</sup>) will be utilized to discover which economic variables influence Ghana's GDP growth rates.

A high R<sup>2</sup> indicates a significant connection between GDP and money supply, interest rates, and inflation. A low R<sup>2</sup> may simply indicate that various economic indicators from different sectors of the economy have an impact on GDP growth rate (Gujarati, 2006).

## **4.1 Analysis and Interpretation of Data**

The OLS method was used to analyze the data during the time period studied (1980–2015). The regression findings for the variables GDP, money supply, interest rate, and inflation at a 5% significant level are shown in the table below.



**What effect does the Monetary Policy of Ghana have on the country's GDP growth? From 1980 to 2015, a retrospective time series analysis**

**TABLE A.1: Estimates of the GDP function in Ghana (1980–2015) with money supply, interest rate, and inflation**

VARIABLES	COEFFICIENTS	T – RATIOS	SIGNIFICANCE
Constant	4.638	3.035	0.005
Money Supply	0.044	1.223	0.232
Interest Rate	0.023	0.683	0.500
Inflation	-0.069	- 2.531	0.018

SOURCE: Ghana Statistical Service (GSS)

Econometrically,  $Y = 4.638 + 0.044MS + 0.023 I - 0.069INFL + \mu$  (3.035) (1.223) (0.683) (-2.531)

$R^2 = 0.428$

F-Value = 6.739

Durbin-Watson = 1.816

No of Observations (N) = 31

Adjusted R2 = 0.365

**4.2 Interpretation of Variables**

The regression result is shown in the table above. In the regression, the R2 value was 0.428, and the adjusted R2 was 0.365. This basically means that the model's explanatory variables account for around 36.5 percent of total fluctuations in economic activity. This also demonstrates that the model was unable to explain the remaining 63.5 percent, implying that variables from other sectors of the economy had the greatest impact, accounting for 0.365 (63.5%) of the total fluctuations in Ghana's economic activities.

**4.3 Money Supply Variable Interpretation**

Money growth is less than T-Value growth, according to the T-Ratio results. because  $|1.223| < |1.703|$   $|tk| < |tc|$  This indicates that the money supply parameter was not statistically significant. This means we accept the null hypothesis H0, which claims that the money supply has no effect on Ghana's economic growth. As a result, I rejected the alternative hypothesis that money supply had a major impact on Ghana's economic growth.

**4.4 Interest Rate Interpretation**

Because the T – Ratio of interest rate was smaller than the T – Value, the interest rate parameter was statistically insignificant in the table above. That is demonstrated by the outcomes.  $|0.683| < |1.703|$   $|tk| < |tc|$ ,  $|0.683|$  This means we accept the null hypothesis H0, which claims that interest rates have no effect on Ghana's economic development. As a result, I dismissed the alternative hypothesis H1, which claims that interest rates have a major impact on Ghana's economic growth.

**4.5 Inflation Variable Interpretation**

Inflation has a detrimental and severe impact on Ghana's economic activities, according to the findings (GDP). The estimated inflation slope coefficient is -0.069, implying that a 1% increase in inflation is related with a 6.9% decline in GDP growth. This further demonstrates that inflation has had a negative and considerable impact on Ghana's economic activity (GDP), since GDP growth reduces by 6.9% for every 1% change in inflation due to the negative sign on the inflation statistic. The T – Ratio results reveal that inflation is higher than the T – Value. Because  $|2.531| > |1.703|$ ,  $|tk| > |tc|$  As a result, I rejected the null hypothesis H0, which claims that inflation has no substantial impact on Ghanaian economic activity. As a result, I supported the alternative hypothesis, which argues that inflation has a major impact on Ghana's economic activity or GDP growth because a 1% increase in inflation causes GDP to fall by 6.9%.

**Table A 2: From 1980 to 2015, Ghana's GDP Growth Rate (Y percent), Money Growth (M percent), Interest Rates (I percent), and Inflation (INFL percent).**

YEARS	GDP (Y) (%)	Money (%) Growth	Interest (I) (%) rates	Inflation (INF) (%)
1980	0.5	30.1	-24.4	50.2
1981	-3.5	54.5	-44.8	116.5
1982	-6.9	19	-9.6	22.3
1983	-4.6	49.3	-48.6	122.8

**What effect does the Monetary Policy of Ghana have on the country's GDP growth? From 1980 to 2015, a retrospective time series analysis**

1984	8.6	60.6	-25.2	39.7
1985	5.1	42.7	5.2	10.3
1986	5.2	44	-6.1	24.6
1987	4.8	52.6	-18.3	39.8
1988	5.6	45	-12.2	31.4
1989	5.1	52.7	-8.2	25.2
1990	3.3	10.8	-21.3	37.3
1991	5.3	7.7	-3.1	18.1
1992	3.9	53	-3.4	10.0
1993	4.8	27.9	-6.3	25
1994	3.3	50.3	-6.8	24.9
1995	4.1	27.9	-48.1	74.3
1996	4.6	50.3	-5.8	34
1997	4.2	33.4	-0.6	27.9
1998	4.7	31.4	-22.5	14.6
1999	4.4	45.4	-6.8	12.4
2000	3.7	17.3	-4	40.5
2001	4.0	44.1	27	33.6
2002	4.5	49.9	25	14.9
2003	5.2	35.8	24	29.8
2004	5.6	26	19.1	18.2
2005	5.9	14.1	16.8	15.5
2006	6.4	38.80	20.0	11.7
2007	6.5	36.30	18.6	10.7
2008	8.4	40.20	25.6	16.5
2009	4.7	26.90	26	19.3
2010	7.7	31.90	24	10.7
2011	4.6	33.99	18.1	8.73
2012	0.7	25.14	15.5	9.2
2013	2.5	19.50	12.7	11.4
2014	1.2	37.29	14.4	15.4
2015	0.9	31.60	13.0	17.4

**SOURCE:** Ghana Statistical Service (GSS)

**5.1 Summary, Conclusion and Recommendation.**

This article investigates the impact of the Bank of Ghana's monetary policy and whether or not it has a substantial impact on Ghana's economic growth. Data were gathered from the Ghana Statistical Service and utilized in the analysis to estimate the linear form of the model from 1980 to 2015. The dependent variable in this paper was GDP, while the independent/explanatory variables were money supply, interest rate, and inflation. Following the findings, conclusions, and interpretations, it was discovered that at a 5% significant level, both money supply and interest rate were statistically insignificant, while inflation harmed the Ghanaian economy. This article also demonstrates that the Bank of Ghana's monetary policy had a 36.5 percent overall impact on Ghana's economic activities and growth, implying that other sectors not covered by the model played a larger role, accounting for 63.5 percent of GDP variation.

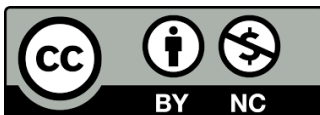
This paper concludes by recommending that, because inflation has been shown to have a negative impact on the level of economic activity in Ghana, the Bank of Ghana should use monetary policy instruments to control the rising level of inflation in Ghana and reduce it to a more appropriate figure (preferably single digit), in order to boost the Ghanaian economy's growth rate.

Financial authorities, such as the Ministry of Finance and Economic Planning (MOFEP), as well as other industry participants, must keep up with the Bank of Ghana's (BOG) overall monetary policy performance on policies that affect microeconomic stability.

## What effect does the Monetary Policy of Ghana have on the country's GDP growth? From 1980 to 2015, a retrospective time series analysis

### REFERENCES

- 1) E.K. Addison, E.K. Addison, E.K. Addison "Monetary Management in Ghana," Bank of Ghana Research Department, 2001. Ghana.
- 2) J.A. Afolabi, J.A. Afolabi, J.A. Afo (1988): "Assessing the Monetary Sector's Impact on the Real Sector of the Economy" Economy: the instance of Nigeria", saving and Development, Vol XII, No.1.
- 3) B.M. Ahmed Abdulrahman (2010): "The Impact of Monetary Policy on Economic Activity in the United States." Sudan: An Empirical Study, 1990-2004" Department of Economics, Faculty of Arts and Sciences University of Zalingei, West Darfur, Sudan, Department of Economics and Social Studies.
- 4) Aryeetey. E., Harrigan, J. M. Nisanke, M. Nisanke, M. Nisanke, M. "Economic Reforms in Ghana; the Miracle" (1994). and the Mirage," by Woeli, published by Africa World Press in the United States.
- 5) Statistical Bulletin of the Bank of Ghana (February 2007): IDSP Department; Bank of Ghana, Accra- Ghana.
- 6) C. K. Dordunoo, C. K. Dordunoo, C. K. Dordun A. Donkor, A. Donkor, A. Donkor, A. Donkor, A "Ghana: Monetary Targeting and Economic Growth," published in 1998. AERC Research Paper 77 "Development"
- 7) S. Fischer The Role of Macroeconomic Factors in Growth (The Role of Macroeconomic Factors in Growth) (The Role of Macroeconomic Factors in Growth) ( The Journal of Monetary Economics is a publication dedicated to the study of money 485–512 in Economics 32 (December). Ghana's GDP, New Series 2011, Ghana Statistical Service (GSS).
- 8) D. N. Gujarati, D. N. Gujarati, D. N. Gujarati, D. N. Gujarati, D. N. Gujarati, D. N. Gujarati, D. N. Gujarati, D. N. Gujarati, D McGraw-Hill, Boston, MA ISSER (1997): The State of the Ghanaian Economy, "inflation viewed as Ghana's biggest problem,"
- 9) The State of the Ghanaian Economy, 1999 (ISSER). Archived Events, Book Forum, J Schwartz (1963): "A Monetary History of the United States." "The main economic challenge," according to the Cato Institute's website.
- 10) M. S. Khan and S. S. Abdelhak "Threshold Effects in the Relationship Between" (2001). Staff Papers on "Inflation and Growth." 48, no. 1: 1–1. International Monetary Fund
- 11) M. S. Khan and S. S. Abdelhak "Financial Development and Economic Growth: A Review" was published in 2003.
- 12) "Review and New Evidence," Journal of African Economics, vol. 12, no. 2, pp. 89–110, September.
- 13) Koustoyiannis "Theory of Econometrics: An Introductory Exposition of" was published in 1977.
- 14) Methods of Econometric Analysis (Macmilan Education Ltd, London, England).
- 15) "Money and Business Cycle," by Milton Friedman (1963).
- 16) Milton Friedman's "A Monetary History of the United States" was published in 1960.
- 17) Forum. Website of the Cato Institute.
- 18) Paul. A Glossary of Political Economic Terms Retrieved from M. Johnson (2005): "Money Stock"
- 19) [http://www.wikipedia.org/wiki/money\\_supply](http://www.wikipedia.org/wiki/money_supply)
- 20) "Macroeconomics": An Introductory Textbook, P. Pomiye, P. Pomiye, P. Pomiye, P. Pomiye, P. Pomiye, P. Pom Chris Pressand is a publisher.
- 21) M. P. Todaro, M. P. Todaro, M. P. Todaro, M. P. Todaro, M. P. Todaro, M. P. Todaro, M. P. Todaro, M. P. Todaro, M. P. Todaro, M. P
- 22) A. R. Sanusi, A. R. Sanusi, A. R. Sanusi (2010): Ahmadu Bello University, Zaria, Nigeria, "An Empirical Analysis of the Money Supply Process in Ghana, 1983-2006."



There is an Open Access article, distributed under the term of the Creative Commons Attribution – Non Commercial 4.0 International (CC BY-NC 4.0) (<https://creativecommons.org/licenses/by-nc/4.0/>), which permits remixing, adapting and building upon the work for non-commercial use, provided the original work is properly cited.