



NEAR EAST UNIVERSITY

INSTITUTE OF GRADUATE STUDIES

DEPARTMENT OF BANKING AND FINANCE

**THE EFFECTS OF MONEY SUPPLY, EXCHANGE RATE AND
INFLATION ON THE GROWTH OF THE GHANAIAN
ECONOMY (1980–2020)**

MSc. THESIS

MARILYN LEAMON MONLU

Nicosia

JANUARY, 2023

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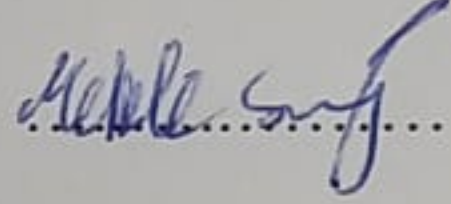

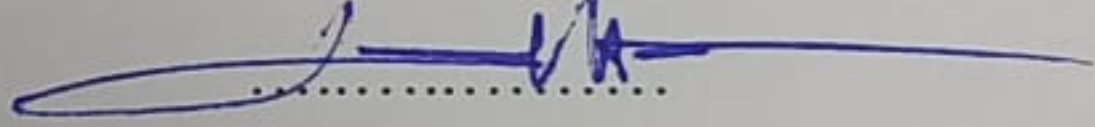

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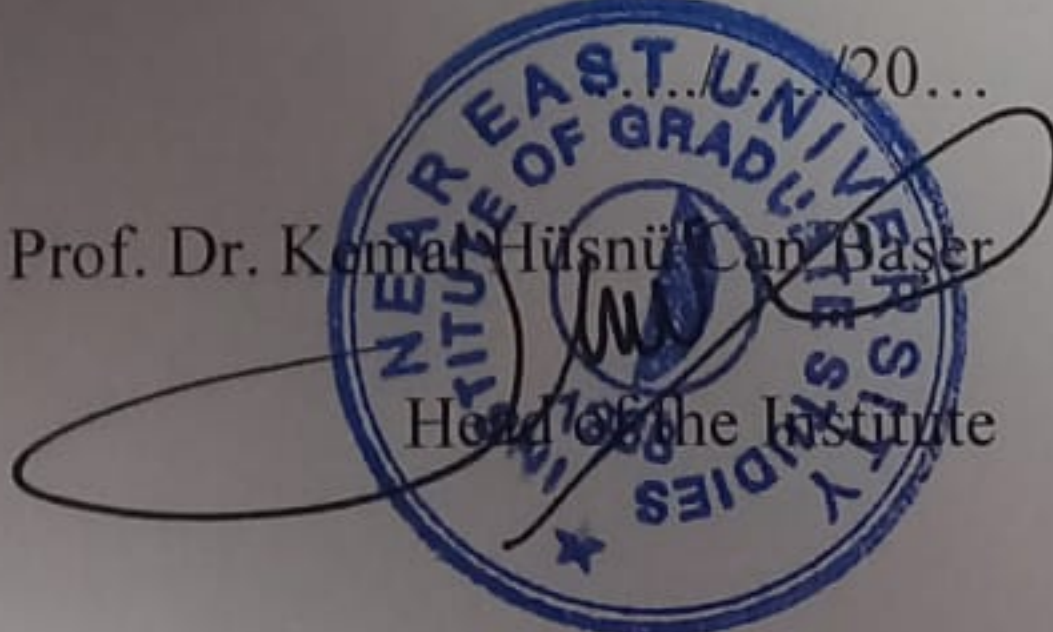
Approval

We certify to having read the submitted thesis by **MARILYN LEAMON MONLU** captioned "**THE EFFECTS OF MONEY SUPPLY, EXCHANGE RATE, AND INFLATION ON THE GHANAIAN ECONOMY'S GROWTH (1980-2020)**" Furthermore, we believe it meets all of the standards for a thesis for the Master of Social Sciences degree, both in terms of scope and level of quality.

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Declaration

I, the undersigned, therefore swear that all of the materials, papers, analyses, and findings included in this thesis were gathered and presented in accordance with the academic norms and ethical principles of the Institute of Graduate Studies at Near East University. In accordance with these standards of conduct, I additionally declare that I have fully cited and referenced any material and data that are not unique to this work. This proclamation was made to ensure that particular rules and behaviors were followed.

MARILYN LEAMON MONLU

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Acknowledgment

I would want to take this opportunity to express my thankfulness to God, the Almighty, for providing me with the strength and tenacity I required in order to accomplish this level of academic achievement at Near East University and graduate with a master's degree in banking and finance.

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MARILYN LEAMON MONLU

Abstracts

The Effects of Money Supply, Exchange Rate and Inflation on the Growth of The Ghanaian Economy (1980–2020)

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MSc. Department of Banking and Finance

January, 2023 Page, 106

This thesis investigates the impact of money supply, exchange rate, and inflation on Ghana's economic development from 1980 to 2020. The International Monetary Fund has praised Ghana on a number of economic fronts, including its capacity to maintain a relatively high real GDP growth rate, its external sector liberalization, and the establishment of a unified floating exchange rate system (IMF). Despite the fact that Ghana's inflation has reduced considerably from its pre-reform period, it remains very high and irregular. As a consequence, it is the first problem that the country's officials find difficult to address. This turns out to be one of the most challenging aspects of the situation. The policy framework in existence during the reform era was known as "monetary aggregate targeting," and the monetary authorities had a tough time meeting the targets that they had set for themselves (Dordunoo and Donkor, 1998). During the period when Ghana's economy was transitioning, two factors dominated the process of setting monetary policy. In the context of the monetary targeting paradigm that Ghana used during the reform period, empirical information on the key contributors to the money supply is critical to efficient inflation control. This is due to the monetary targeting framework serving as the framework's base. For analysis, the newly developed ARDL model and the Granger causality tests were used. The findings indicate that the exchange rate and inflation have a negative impact on the Ghanaian economy, but that widening the money supply has a beneficial impact on the Ghanaian economy in both the long and short term. According to the findings, national and global firms' financial management should maintain a careful check on price rises, the monetary policy rate, the current account balance, the money and quasi-money supply as a percentage of GDP, the GDP per capita growth rate, and the exchange rate. All of these elements influence the entire economy. All of these variables have the potential to have a big influence on the economy. These and other factors may be examined alongside others as inputs into economic choices made during trade talks in order to maximize shareholder profit.

Keywords: Broad money, Inflation, Exchange rate, economic growth, monetary poli

Özet

Para Arzı, Döviz Kuru ve Enflasyonun Gana Ekonomisinin Büyümesine Etkileri (1980–2020)

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MSc. Bankacılık ve Finans Bölümü

Ocak, 2023 Sayfa,116

Bu tez, para arzı, döviz kuru ve enflasyonun 1980'den 2020'ye kadar Gana'nın ekonomik gelişimi üzerindeki etkisini araştırıyor. Uluslararası Para Fonu, Gana'yı nispeten yüksek bir reel GSYİH büyüme oranını sürdürme kapasitesi de dahil olmak üzere bir dizi ekonomik cephede övdü. dış sektörün serbestleştirilmesi ve birleşik bir dalgalı döviz kuru sisteminin (IMF) kurulması. Gana'nın enflasyonu, reform öncesi dönemden önemli ölçüde düşmüş olmasına rağmen, hala çok yüksek ve düzensiz. Sonuç olarak, ülke yetkililerinin ele almakta zorlandıkları ilk sorun bu. Bu, durumun en zorlu yönlerinden biri olarak ortaya çıkıyor. Reform döneminde var olan politika çerçevesi “parasal toplam hedefleme” olarak biliniyordu ve para otoriteleri kendileri için belirledikleri hedeflere ulaşmakta zorlandılar (Dordunoo ve Donkor, 1998). Gana ekonomisinin geçiş sürecinde olduğu dönemde, para politikasının belirlenmesi sürecinde iki faktör hakim olmuştur. Gana'nın reform döneminde kullandığı parasal hedefleme paradigması bağlamında, para arzına temel katkı yapan unsurlara ilişkin ampirik bilgiler, verimli enflasyon kontrolü için kritik öneme sahiptir. Bunun nedeni, çerçevenin temeli olarak hizmet eden parasal hedefleme çerçevesidir. Analiz için yeni geliştirilen ARDL modeli ve Granger nedensellik testleri kullanılmıştır. Bulgular, döviz kuru ve enflasyonun Gana ekonomisi üzerinde olumsuz bir etkiye sahip olduğunu, ancak para arzını genişletmenin Gana ekonomisi üzerinde hem uzun hem de kısa vadede olumlu bir etkiye sahip olduğunu göstermektedir. Bulgulara göre, ulusal ve küresel firmaların mali yönetimi, fiyat artışlarını, para politikası faizini, cari işlemler dengesini, GSYİH'nın yüzdesi olarak para ve yarı para arzını, kişi başına GSYİH büyüme oranını dikkatli bir şekilde kontrol etmelidir. ve döviz kuru. Bütün bu unsurlar tüm ekonomiyi etkiler. Tüm bu değişkenler ekonomi üzerinde büyük bir etkiye sahip olma potansiyeline sahiptir. Bu ve diğer faktörler, hissedar kârını en üst düzeye çıkarmak için ticari görüşmeler sırasında yapılan ekonomik seçimlere girdi olarak diğerleriyle birlikte incelenebilir.

Anahtar Kelimeler: Geniş para, Enflasyon, Döviz kuru, ekonomik büyüme, para politikası

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Abbreviations

ARDL: Autoregressive Distributed Lag

INF: Inflation

GDP: Growth Domestic Product

BM: Broad Money

REER: Real Effective Exchange Rate

IMF: International Monetary Fund

PPP: Purchasing Power parity

BOG: Bank of Ghana

IFE: International Fisher's Effect

ECM: Error correction model

VEC: Vector Error Correction

OLS: Ordinary Least Square

DSGE: Dynamic Stochastic Equilibrium Model

CHAPTER I

Introduction

The Ghanaian Economic Reforms Program which began in 1983 and is now the only one of its kind among West African countries, has been deemed by a number of evaluators to be one of the few success stories in Africa (see for instance, IMF, 1994). The International Monetary Fund has complimented Ghana on a number of economic fronts, including its ability to sustain a reasonably high real GDP growth rate, its liberalization of its external sector, and its implementation of a unified floating exchange rate system (IMF). Despite the fact that inflation in Ghana has dropped dramatically since its pre-reform period, it is still fairly high and erratic. As a result, it is the first issue that proves to be tough for the country's authorities to deal with. This turns out to be one of the things that causes the most difficulties overall. During the whole of the reform period, the policy framework that was in place was known as monetary aggregate targeting, and the monetary authorities had a very difficult time achieving the goals that they had set for themselves (Dordunoo and Donkor, 1998). During the era in which the economy of Ghana was undergoing its transition, two elements predominated in the process of determining monetary policy. These aspects have been supported by evidence that has been given in the research to be the primary contributors to the country's inflationary cycle. These are the growing capital inflows as well as the financing of the budget deficit.

It is possible that the relative importance of these elements has shifted over the years as a result of the large growth in capital inflows, which have come mostly in the form of remittances and donations from other countries. As a consequence of this, the primary purpose of this investigation is to carry out an empirical analysis of the varied roles that each of these elements has had in the evolution of the money supply ever since the reforms were first put into place. The factors that led to the most obvious shifts in monetary aggregates are given the focus and attention they deserve. In the context of the monetary targeting framework that Ghana adopted throughout the reform era, having empirical information regarding the primary contributors to money supply is essential to the effective management of inflation. This is because the monetary targeting framework serves as the foundation for the framework. This is especially true in light of the fact that Ghana adopted this framework during the period. The determination of which aspect of the money supply is predominant is, in point of fact, a significant challenge for monetary

policymakers working within such a framework. Academic and policy discussions in Ghana have, for the most part, been centered on the importance of fiscal deficit financing and capital inflows, most notably foreign aid. This has been the situation in the business sector as well as the public sector (for example, see Leith and Soderling, 2000; Younger, 1992; Tsikata, 1999; Dordunoo and Donkor, 1998; Addison, 2001; and Sowa, 2004). There are several books that are comparable, some of which include Leith and Soderling (2000), Younger (1992), and Tsikata. These are only a few examples from 1999. Both of these factors have been blamed for the rise in the money supply, as well as the difficulty of central banks in controlling inflation as a direct result of the former. In order to speculate on the relative importance of factors such as fiscal deficit finance and foreign currency inflows to the concept of monetary growth, this article makes use of the money multiplier technique. In particular, the focus of the paper is on the connection that exists between these two aspects.

It was expected that the rise in the number of innovative financial products would have some type of effect on the economies of developing countries. These enhancements, as suggested by Bernardier&Plouffe (2019); Frame & White (2014); and Lumsden (2018), would boost financial inclusion and guarantee an appropriate distribution of resources. Because of this, several individuals who do not currently have bank accounts but may potentially get advantages from having one (Demirgüç-Kunt&Klapper, 2013) would be able to open one. The expansion of access made possible by developments in the financial sector could have various implications on the monetary policy that is implemented by central banks. According to one view on the relationship between financial innovation and development, which is in contrast to another theory, the interest rate channel of the monetary policy transmission is strengthened by financial innovation. Alternately, one may make the case that the introduction of new financial innovations does not have an effect on the distribution of monetary policy (Noyer, 2007). On the other hand, this would make it far more difficult to carry out monetary policy. As you can see, this can turn out to be a problem.

Mobile money services have been on the increase in the financial technology sector thanks to the continent of Africa's well-developed financial infrastructure. Transferring money through mobile device, making payments via mobile device, and carrying out other financial transactions via mobile device have all grown commonplace across the area (Orekoya, 2017). Mobile banking has benefited

tremendously from the increased availability of mobile phone networks (Nyamongo&n.d.irangu, 2013). Mobile money services have allowed tens of millions of previously unbanked persons to get access to traditional banking services and are extensively used in Ghana for the purpose of money transfer. At the end of 2017, Ghana had 37,445,048 individuals who used mobile phones, and of those people, 23,947,437 utilized mobile money. Unbelievably, 83.1% of all individuals in the nation have access to mobile money (Boateng, 2018). Mobile money transactions reached a total of GHS 89.1 billion at the end of June 2021, representing a 96.6% increase from the same period in 2020. (BoG, 2021).

The widespread adoption of mobile money as a payment system has resulted in a variety of favorable side effects, such as the decrease in poverty, the growth of the economy, the widening of prospects for savings, and the facilitation of entry into the financial industry. These positive side effects have been brought about as a result of the widespread adoption of mobile money as a method of payment (Adaba et al., 2019; Asamoah et al., 2020; Boateng, 2018). Despite these benefits, there are still a lot of questions that need to be answered regarding the impact that mobile money will have on Ghana's ability to formulate and implement monetary policy. The term "mobile money" refers to a form of electronic currency that may be electronically transmitted. On the contrary, Mawejje and Lakuma (2019), citing Tumusiime-Mutebile (2015), claim that the widespread usage of mobile money may weaken the effectiveness of monetary policy through interest rate channels. They base their argument on the fact that mobile money is becoming increasingly popular. They base their argument on the fact that mobile money is becoming more popular. Simpasa et al. expressed their concern that the use of mobile money might potentially lead to inflation in poor countries (2011). Concerns have also been expressed about the potential for mobile money to make monetary policy less effective and to enhance the degree to which prices fluctuate. Mobile money has been shown to have a modest influence on money supply aggregates, according to research conducted by Mawejje and Lakuma (2019). This finding may have repercussions for monetary policy. There is no evidence to support the premise that the usage of mobile money leads to inflation, according to the findings that were published by Aron et al. (2015) and Adam and Walker (2017). These researchers investigated the subject (2015). There is a dearth of data to back up the idea that transactions carried out using mobile money have no bearing on the direction in which monetary policy is headed. To the best of

our knowledge, there have been no studies undertaken on the topic of whether or not the use of mobile money in Ghana has an impact on the efficiency of the monetary policy that the government of Ghana has put in place. This is something that we believe should be investigated. Orekoya (2017), in contrast, limited the scope of his investigation to solely Nigeria, although the vast bulk of the earlier research that explored the influence of mobile money on macroeconomic variables focused on Eastern African countries.

Research on the economy that was conducted in nations that use monetary targeting, such as that conducted by Aron et al. (2015) and Mawejje and Lakuma (2019), is not applicable to the economy of Ghana. This is because the research was conducted in those nations. This is due to the fact that Ghana does not participate in monetary targeting, which is the root cause of this particular outcome. Considering the rapid increase of mobile money in Ghana within the framework of the inflation targeting regime, a study of the impact of mobile money on the effectiveness of monetary policy is essential. This growth has taken place within the context of the regime.

Despite the fact that some reforms, like FINSAP and the NBFi initiative were relatively effective, there are still great deal of problems that are hurting the financial system. The Exchange Control Act, the Banking Law, the Insurance Law, the Financial Institutions Law, and the Bills of Exchange Act seem to be just a few of the many laws that contribute to these difficulties by restricting or outright prohibiting particular kinds of financial activities. Other laws, such as the Financial Institutions Law, the Insurance Law, and the Banking Law, are also at fault. Other laws include the Financial Institutions Law, the Exchange Control Act, and the Bills of Exchange Art (Mensah, 2017). As a direct result of this, the Financial Sector Strategic Plan (FINSSP) was established in 2003 with the intention of fostering the growth of a well-rounded financial sector that encompassed both banking institutions and non-banking institutions. Additionally, the FINSSP was progressively put into operation. As a direct consequence of FINSSP I, which took occurred between 2003 and 2011, many different pieces of law were brought up to date. The Securities and Exchange Commission Regulations from 2003, the Venture Capital Trust Act from 2004, the Bank of Ghana Act from 2004, the Foreign Exchange Act from 2006, the Insurance Act from 2006, the Credit Reporting Act from 2007, the Central Securities Reporting Act from 2007, the National Pensions Act from 2008, and the Non-Bank Financial

Institutions Act from 2008 are some examples of these laws (2008). The pace of increase in GDP between 2001 and 2016 suggested that there was progress being made on the macroeconomic front. It is clear that the economy is prospering given that its annualized rate of growth increased from 6% in 2005 to 14% in 2011.

According to Kwakye (2012), the nation used monetary targeting prior to the year 2007, which is a method of conducting monetary policy in which the amount of currency in circulation served as the primary emphasis, with inflation and growth serving as secondary objectives. However, the country was only able to achieve a modest level of success with this strategy. As a result of this development, central banks began adopting a strategy known as inflation targeting (IT), in which they make use of the policy rate (PR) to take an active role in pursuing their inflation objectives. According to the findings of Bawumia (2010), the IT blueprint has resulted in the finest performance in terms of macroeconomic economic indicators out of all of the monetary policy structures that have been defined and put into action in the nation since it gained its independence. This is the case despite the fact that other frameworks have been formed and put into action in the country. Even though a different information technology framework was set up at first, this turned out to be the case.

In the past, we've made fast progress in understanding the theories that drive monetary policy and economic growth. However, this progress has been marked by divergences, obscurities, lack of clarity, and "pass currents" (Brunner and Meltzer, 2009). 1972). QTM (Gali, 2008) is the standard economics textbook for its explanation of monetary policy and the development of economies.

Yet it wasn't until the Keynesian Liquidity Preference Theory was presented in the 1930s that a really contemporary theory emerged. In the twenty years that followed, various new models, such as the New Keynesian Model, the New Consensus Model (NCM), and the New Classical Real Business Cycles, have emerged as the dominant frameworks for conducting research on monetary policy (Goodfriend and King, 1997; Arestis and Sawyer, 2008). Through the years, scholars have debated whether or whether monetary policy has a short- or long-term effect on real variables, especially output. The United States has been singled out for special attention in this study (Walsh, 2003).

Most studies focus on the long-term and on industrialized countries, where monetary policy is assumed to have little effect (Asongu, 2014).

Since there has been a recent uptick in free commerce between nations, the currency exchange rate has emerged as one of the most crucial macroeconomic variables. As a result, it has been the topic of a substantial amount of academic study because of its newfound significance. Because it is used to establish the relative values of a country's exports and imports, the exchange rate has a direct impact on the amount of money that nations make as a result of their participation in international trade. As a direct result, most developing country governments now prioritize maintaining relatively stable exchange rates. The constant weakening of their currencies is a problem for emerging countries since they import so much. The bulk of domestic businesses have been severely impacted since they must now find other sources for the imported raw materials and intermediary goods upon which they rely. Because of the impact that it has on the desire for imports and exports, the exchange rate has an impact on the pace of economic growth experienced by countries. The results could be either favorable or unfavorable.

Following the collapse of the Bretton Woods system in 1973, a number of nations made the decision to go from having fixed exchange rates to having floating ones. These days, supply and demand are the primary factors that decide how much one currency is worth in relation to another. It is reasonable to anticipate an increase in the market's level of volatility given the ease with which factors impacting the demand for and supply of a specific currency can now alter the exchange rate. Because of this, the exchange rate continues to be one of the most volatile influences on the entire world's economy. As a result, studies have been carried out in order to gain a better understanding of the impact that changes in the value of other macroeconomic factors have on the currency exchange rate. Both nation-by-nation and international comparisons of the factors influencing the value of currencies have been conducted. The research' findings have been meticulously documented.

Purchasing power parity (PPP), the International Fisher's Effect (IFE), and the Mundel-Fleming framework are some of the theories and hypotheses that suggest a connection between exchange rates and inflation and interest rates. These theories and hypotheses include components such as the International Fisher's Effect (IFE) and the Mundel-Fleming model (Ebiringa&Anyagu, 2014). For instance, both the IFE and PPP theories illustrate that high inflation has weakening implications for the national currencies of the country in which it occurs. This is the case because national currencies are pegged to the value of the nation's currency. According to the

IFE, the difference in nominal interest rates will be the primary factor in determining the future spot exchange rate (Sundqvist, 2002). According to this idea, nations that have interest rates that are higher than their trade partners would see a decline in the value of their currencies as nominal interest rates rise. This will be a reflection of the different levels of inflation that are anticipated in each nation (Ebiringa and Anyaogu, 2014).

The value of the Ghanaian currency has been steadily falling when compared to the world's most important trade currencies in recent years. The Bank of Ghana attempted a number of different things, such as re-denominating the currency in 2007, but it did not have very much success with any of them. Because of this, a lot of attention has shifted to finding out why the currency keeps falling in value.

Academics and policymakers alike devote a significant amount of time and energy to researching the relationship that exists between expansion of the economy and key macroeconomic indicators such as the money supply and inflation rate. All economies, seen as a whole, have the same overarching objective, which is to maximize production while minimizing inflationary pressures. On the other hand, Okun's Law and the Phillips Curve show, in conformity with the Keynesian model, that as the aggregate supply (AS) curve slopes higher, inflation and production advance in tandem in the near term. This is the case when the slope of the aggregate supply curve is higher. In this scenario, the slope of the total supply curve is larger. This is the circumstance that occurs when the Phillips Curve is trending upwards (Mankiw, 2016). (Mankiw, 2016). Because of this, in order for policymakers to achieve their goals, they will need to make a choice between promoting strong GDP growth and maintaining low prices. In an effort to acquire a growing rate of output, economic managers will frequently implement policies that result in inflationary pressure. In the next section, we will investigate this phenomenon in more depth so that we may better demonstrate this idea. In addition, the asset methodology contends that because of the short-run rigidity in pricing, a monetary expansion has the capacity to reduce the cost of financing, raise investment, and ultimately increase output. This is due to the fact that an expansionary monetary policy tends to increase aggregate demand, which in turn increases production. This is due to the fact that a monetary expansion addresses the short-run rigidity in pricing in a different manner than a contractionary one does. This is due to the fact that a programme of monetary expansion ultimately results in maintained price stability. On the other hand, the

classical school of economics contends that an increase in nominal interest rates will not have any effect whatsoever on real production if an accompanying increase in prices as a result of long-run price movements occurs concurrently with the loosening of monetary policy. This is because, according to the classical school, real production will not be affected by the rise in nominal interest rates. This is because of the pattern of prices over a longer period of time (Krugman et al., 2018). Because of this, and in accordance with the theoretical frameworks that were shown earlier, it is anticipated that, over the course of time, the increase in production will be largely immune to variations in the amount of money that is available and the rate of inflation.

The empirical research that was conducted on the connections between inflation, economic growth, the exchange rate, and the amount of money in circulation produced contradictory findings that are comparable to the conclusions that were reached in the theoretical frameworks that were described earlier (Saymeh&Orabi, 2013; Agalega&Antwi, 2013; Bhat&Laskar, 2016; Enu et al., 2013; Dingela&Khobai, 2017). Dingela and Khobai (2017), for instance, found that there was no correlation between higher prices and rising production in South Africa. This was the conclusion that they reached. This conclusion is supported by an earlier experiment that was carried out in Ghana (Agalega&Antwi, 2013). Saymeh and Orabi (2013) conducted research on Jordan's real GDP. They investigated the influence that GDP, borrowing costs, and inflation played in the economy. The level of price is a crucial component that plays a role in establishing genuine output, as indicated by the outcomes of their study. The outcomes of research carried out in Ghana by Agalega and Antwi (2013), Enu and colleagues (2013), and Bhat and Laskar (2013) provide credence to this conclusion (2016).

It was shown in research carried out in Nigeria (Gatawa et al. 2017), Ghana (Ahiakpor&Akapare, 2014), and South Africa that the amount of money in circulation has a statistically significant impact on the expansion of the economy (Ahiakpor&Akapare, 2014). Majumder (2016) found the opposite to be true in Bangladesh, where he found that the quantity of money has no impact on the rate of economic development in the nation (Dingela&Khobai, 2017). (Dingela&Khobai, 2017).

The economic condition of a nation and the country's total financial stability are both directly influenced by the monetary policy of the nation's central bank. This

policy also has an effect on the state of the nation's economic stability are both directly influenced by the monetary policy of the nation's central bank. This policy also has an effect on the state of the nation's economy. The employment of monetary policy to maintain price stability is one method that is thought to have the potential to boost long-term economic development. This strategy is considered to have the ability to promote long-term economic development. According to Christiano and Fitzgerald (2003), people and companies are excused from taking inflation into account when making day-to-day decisions so long as inflation is at a level that is low enough. It's possible that a government may exert more effective influence over the economy when it uses both fiscal and monetary policies.

The most obvious component of fiscal planning is the process through which the government adjusts the amount of expenditure it undertakes in order to monitor and influence the economy. This is due to the fact that it has direct control over the expenditures made by the government, including both recurring and investment spending.

The activities that are made by a nation's central bank in order to maintain monetary stability are referred to as monetary policy. This authority's primary mission is to control interest rates in the aim of fostering economic development and maintaining economic stability. It has been said that one of its goals is to lower unemployment rates while attempting to keep prices roughly steady. In point of fact, all of the many "schools" of thought about monetary policy require modifying the total quantity of money that is in circulation. Activities that take place on an open market, such as the selling and purchase of (government-issued) debt and credit instruments have the potential to influence the base currency's liquidity. On the open market, liquidity management is performed. As a consequence of the continuous buying and selling operations that take place at the central bank, the availability of money might be unpredictable. However, the influence is not limited to these two market indicators; it also extends to the currency exchange rate and interest rates in the near future.

It is possible for this to have either an expansionary (meaning an increase in the money supply at a rate that is quicker than is typical or even a reduction in it) or a contractionary effect on the economy, depending on the effect that you want it to have on the economy (which means increasing the money supply at a slower rate than is typical or even shrinking it. By referring to monetary theory, one may identify

the optimal monetary policy, which can either be expansionary or contractionary, depending on the circumstances (Lipsey et al., 2001).

Economists have offered a wide range of explanations for the term "inflation," but there is one constant at their core. The term "inflation" is generally understood to mean a general rise in prices, according to economists. Pigou (1947) attempts to explain this phenomenon by defining inflation as a sustained increase in prices.

Inflation may also be defined as an overall price level that is consistently and significantly higher than it was before. Inflation is commonly understood to refer to an increase in either the general level of prices or the cost of living in a country (Ackley, 1960). This term is considered to be one of the most widely known in economics. According to McMahon (2007) and Amadeo (2012), it is the time during which prices for the vast majority of products and services gradually grow over the course of time. The term "inflation" refers to both a rise in the price of goods and a rise in the price of products. Inflation is defined as both of these things happening simultaneously. The quality of your life will decrease when this happens. This is because it may take more money to buy the same quantity of goods and services as one dollar may buy fewer of them. More nuanced calculations may be made for things like meals and services like a haircut. Simply said, inflation measures the average annual percentage increase in the prices of a specified basket of goods and services.

Governments everywhere use a toolkit of policy options to maintain peace and order. Exchange rates, prices, incomes, and supply-side strategies are a few examples of the factors that fall under this category. The policy levers that are employed most frequently are monetary and fiscal measures. During periods of economic instability, the country's central bank could employ policies like changing interest rates or increasing the amount of money in circulation. In contrast to this, the toolbox for fiscal policy consists of the government engaging in activities such as taxation and expenditure. According to the Bank of Ghana (2017), monetary policy is the way the central bank keeps a close eye on the amount of money in circulation and the policy rate to reach goals like low inflation, a stable currency exchange rate, and economic growth.

It is also seen as a tool that the central bank uses to control how much money is available, how much it costs (Central Bank of Nigeria, 2009). 2011). this action is taken to accomplish broad macroeconomic objectives.

By adjusting monetary policy, economists are able to influence the flow of money through the economy. To maintain price stability and production growth, most nations' monetary authorities, headed by the central bank, are tasked with enforcing monetary policy. The finest inflation-control techniques, according to certain schools of thinking, must be put into place at any costs if the desired level of growth is to be achieved. Quah and Vahey (1995) and Blanchard are among those who support this view (2016). This idea explains why many people believe that an independent central bank is necessary to rein in wasteful government spending and promote economic growth. The idea is revolutionary since it provides a new way to combat inflation and economic stagnation, as stated by Frenkel and Johnson (2013). Keynesians oppose monetarists and instead advocate a big government spending program (Khosravi&Karimi, 2004). Those who subscribe to the monetarist school of thought argue that monetary policy is more reliable than fiscal policy in maintaining economic equilibrium.

2010).

According to Anowor and Okorie (2016) and Precious (2014), the monetary policy of low-income countries can have an effect on a variety of economic indicators, including employment, inflation, GDP growth, and BOP deficits. These are only some of the indicators. Nonetheless, the influence that monetary policy has on the macroeconomy is contingent on both the manner in which it is carried out and the choices made by the central bank regarding the policy instruments that should be used (Alavinasab, 2016).

The central bank's goal is to encourage both economic growth and stability. To do this, it uses the tools it has to change both the amount of money available and the interest rates in the banking system. The possibility of tainted central bank forecasting and policy execution systems leading to unintended consequences is a major source of anxiety in this area. This exemplifies the central bank's pivotal function in addressing distortions in the monetary system that have a negative impact on economic development and job creation. Many tools, including open market operations (OMO), the discount rate, and moral persuasion, are at the central bank's disposal in order to carry out its mandate.

Monetary policy in Ghana is led by the Bank of Ghana (BOG), with the dual aims of containing inflation and fostering the country's economic growth (Bank of Ghana, 2017). The BOG "Act 612" (2002) accomplishes these aims by giving the bank the

power to set policy rates and making it responsible to parliament. Giving the bank some independence would ensure that it can do its job without any interference. Modifications in the short-term policy rate and money supply are expected to cause variations in other rates and money demand, which in turn influence the entire economy. These tools serve as the BOG's primary instruments for maintaining stability (Dagher&Kovanen, 2011). In this manner, the government will be able to realize its objective of continuous economic growth and employment, while the central bank will be able to realize its target interest rate and retain control over the supply of money in order to keep prices stable and manage people's expectations.

Although the Bank of Ghana (BOG) is fulfilling its regulatory responsibilities, the public in Ghana is always preoccupied with issues that the BOG is tasked with addressing, including inflation, economic growth, unemployment, the value of the cedi, and more. The BOG's inflation goal, for instance, is 8%, although it is not always fulfilled. When things like this happen, the public loses faith in the bank and starts to wonder if there's been a problem with how monetary authorities carry out their policies. This is especially true for a central bank, which is supposed to be independent and has the job of taming inflation.

A foreign currency's exchange rate is the amount it costs in domestic currency at the current market exchange rate. It might be predetermined beforehand or left up to the free market. In other words, the demand and supply of foreign currency.

This theory holds that a higher exchange rate shows that foreign currency has become more expensive, which is the same as the domestic currency weakening or depreciating. A similar pattern remains true for the value of the country's native currency, which is to say that the value of the currency goes up whenever the exchange rate goes down. The real exchange rate can be defined as the ratio of the prices of domestic and international products (indicated by the symbol e) to the prices of domestic and global goods (represented by the symbol E). Since the actual exchange rate has increased, imported products are more expensive than domestic ones. As a consequence, both domestic consumers and tourists from outside are expected to increase their spending on domestic goods at the expense of global commodities. The inverse is correct. The average of the effective exchange rate and the real exchange rate, weighted by their respective importance. The weighted average was calculated for a set of nations and a basket of currencies.

The important of money supply in the economy

In a word, the expansion of the money supply is vital since inflation is likely to take place if it occurs at a rate that is greater than the ability of the economy to provide goods and services. This is why the money supply is important. To put it another way, the expansion of the money supply shouldn't be permitted to run ahead of the expansion of the economy. In addition, if the money supply does not increase at a fast enough rate, this could result in a decrease in output, which, in turn, could lead to a rise in the rate of unemployment. Major economic indices, including nominal gross domestic product (GDP) and the price level, have been shown to have a strong correlation with measurements of the money supply. This relationship has been established. In a great number of different time periods, relationships of this sort have been observed. In addition to providing valuable insight into the near-term trajectory of the economy, some economists, perhaps most notably Milton Friedman, have asserted that the money supply is the primary determinant of prices and inflation over the long run. This is in addition to the fact that the money supply provides insight into the economy. This line of reasoning is partially supported by the relationships described above. Measures of the money supply have been utilized as significant guidance in the past by central banks, notably the Federal Reserve, in the process of determining how to conduct monetary policy.

In spite of this, the correlations in the United States between the many different measurements Over the course of the most recent several decades, there has been a great deal of unpredictability in monetary policy due to fluctuations in the money supply as well as other factors such as the growth of the GDP and inflation. As a consequence of this, the money supply has lost some of its lustre as a primary measure of the success that the Federal Reserve has had in conducting monetary policy in the United States. In order to put monetary policy into effect, the Federal Open Market Committee, which is the entity within the Federal Reserve System that is responsible for making monetary policy decisions, continues to constantly analyze money supply data. Estimates of the money supply are only one of many different financial and economic indicators that policymakers use when formulating their decisions.

Statement of the problem

While research has been conducted This is confusing because every economy would want to know how the money supply affects its growth, but it should also be able to tell if economic growth causes an increase in the money supply (Friedman and Schwartz, 1963; Acemoglu and Zilibotti, 1997; Mansor, 2005; Saidu, 2007; Ogunmuyiwa and Ekone, 2010; Jawad et al., 2011; Havi and Enu, 2014; Prasertet .And, after the money supply has affected growth, does growth influence the money supply, whether at the optimum or intermediate level, such that monetary authorities may know how much more growth is required to equal the money in circulation at any moment in time? (Albatel 2000).

Otherwise, there may be an economic degradation in which monetary authorities are forced to use the wrong monetary instruments to achieve the desired economic growth rate because they cannot precisely estimate the amount of money required for a specific growth rate (Njimanted et al., 2016).

To deepen and clarify the argument, economies such as Pakistan and Thailand have demonstrated that, while money supply influences economic growth positively, economic growth also causes and has a positive significant impact on the amount of money in circulation when the economy grows to the optimal level of 7.1%. Thus, both economic development and money supply cause each other (Abbas & Hussain, 2006; Abbas, 1991), making it easy for Pakistan to deploy suitable monetary policy instruments to achieve optimum growth. Comparable research conducted in the Malaysian and Nigerian economies indicated that, although money supply has a beneficial effect on the economy, economic growth has no substantial impact on money in circulation. Thus, in the Nigerian economy, money supply has only a one-way influence on growth (Kalumia & Yourogou, 1997; Chimobi & Uche, 2010; Tan & Baharumshah, 1999). This adds to the effort to see whether economic development and money supply might affect each other in the Ghanaian economy. This will make it easier to figure out how much money is needed for the medium and best levels of growth.

When M2 was utilized to access the impact it has on the Nigerian economy, it turned out to have a small negative influence, which differed from the findings obtained when M3 was employed in the same Nigerian economy at the same time merely because of the inclusion of foreign currency deposits (Okpara, 2019). This implies that foreign currency deposits, as a component of M2+, have the ability to

change or sustain the influence of money quantity on any economy. Further study into the wide money supply influence and its capacity to create changes in Ghanaian economic development is required.

Purpose of the study

The primary goals of this research were to establish (1) whether the expansion of Ghana's broad money supply (M2+) is a general cause of economic development and (2) whether the expansion of Ghana's wide money supply is driven by the expansion of the country's gross domestic product. These were the key questions that were intended to be answered by the findings of this study (GDP).

Research Questions

1. Does an increase in Ghana's broad money supply growth (M2+) cause the economy to grow?
2. Does Ghana's growing GDP result in a matching increase in the country's M2 money supply?

Research Hypothesis

H0: There is no relationship between money and economic growth in Ghana

H1: There is a relationship between money and economic growth in Ghana

H0: There is no relationship between exchange rate and economic growth in Ghana

H1: There is a relationship between exchange rate and economic growth in Ghana

H0: There is no relationship between inflation and economic growth in Ghana

H1: There is a relationship between inflation and economic growth in Ghana

Significance of Research

The study's most significant ramifications are in education, research, and the development of public policy. By presenting a full report on the two-way

dimensional effect that exists between money supply and economic development, this research will make a substantial addition to the literature, especially on the bi-causal nature of money supply and the growth of the Ghanaian economy. This payment will be made for the benefit of educational actors. The study will also educate monetary authorities, enabling them to boost the economy not just from a monetary standpoint but also without a thorough grasp of the fiscal position and economic direction. This is due to the fact that the research will look at both of these factors. As a result, the study is very relevant to making academics understand that, while monetary policies are beneficial to the advancement of the economy (Kimberly, 2018; Khabo, 2012), it is also necessary to know the level of growth that corresponds to any amount of money supply disbursed into the macroeconomic economy before the monetary policy can become fully relevant. This is because any amount of money added to the economy leads to the same amount of growth.

Inspiring the implementation of strong macroeconomic policies and crucial monetary policies, which are critical for the central bank's inflation targeting processes, is another area where the study finds hope. For monetary authorities, this is critical since it enables them to now match optimum or middle-level growth to their respective money in circulation for the sake of equilibrium, dramatically reducing the amount of money chasing after fewer products or less money chasing after greater growth (money growth mismatch).

Scope of the Study

This study set out to answer the question, "Does an increase in Ghana's money supply cause a rise in the country's GDP. In addition, time-series data spanning from 1980 all the way through 2020 was used in order to accomplish the objectives of this research. Because these macroeconomic elements do not exist in isolation from one another, the researcher also investigated and reviewed the interactions between some macroeconomic elements, such as exchange rates and inflation rates, and how they affect Ghana's economic growth. This was done in order to fully understand the transmission mechanism from money supply to economic growth.

Study Limitation

Although other monetary variables such as infrastructure development, government debt, and technology are equally important in this analysis, we looked just at how monetary policy affects GDP expansion. The relationship between the money supply and CPS credit was not explored in the research. Or how the private sector contributes to money supply growth. Despite the fact that CPS is a substantial component, this is the case.

The ARDL model was the only one used to analyze this study, and the thesis theory is based on or limited to the Money Quality Theory.

Definition of terms:

Broad Money: A monetary aggregate that includes both "narrow money" (highly liquid currency) and fewer liquid forms is referred to as "wide money" (such as banknotes and coins). The European Central Bank, the Organization for Economic Cooperation and Development, and the Bank of England all use the term "broad money" to describe something that is unique to that institution.

When referring to the overall amount of cash that is in circulation, the phrase "wide money" is often used. All liquid assets that may be used as currency or kept in reserve to be utilized as payment are included in the definition of the money supply. This includes cash, money in bank accounts, and anything else that has a value similar to money.

Because many different financial products may be traded for cash and deposited in various limited accounts, economists have a difficult time determining how much money flows in any country at any one time. As a result, the supply of money is measured in several ways.

The method that is used to calculate a nation's money supply differs from country to country, but broad money is typically the most comprehensive measure. It includes all highly liquid assets, such as currency and checkable deposits (which are collectively referred to as "narrow money"), in addition to somewhat less liquid forms of capital.

Inflation: Consumers' purchasing power may be regarded as decreasing over time due to price inflation. The rate at which one's buying power is being eroded can be estimated by considering the average price increase of a chosen basket of goods and services over a specific time period. This can be done over a longer period of time.

The rate at which one's buying power is being eroded can be estimated by considering the average price increase of a chosen basket of goods and services over a specific time period. This can be done over a longer period of time. One dollar now buys less than it did in the past because of inflation, which is expressed in percentage terms. On the other side, deflation causes prices to decrease and incomes to rise. The phenomena has been likened to inflation.

Capital inflows: Financially speaking, capital inflows are the amount by which foreign investors spend to acquire local assets (the difference between purchases and sales). The net purchase of foreign assets by domestic agencies other than the central bank is the same as the capital outflows.

Budget deficit: The size of a country's budget deficit, which happens when the country spends more than it earns each year, is often a good indicator of the country's economic health. The term is often used to denote public spending as opposed to that of private organizations or individuals.

Exchange rates: Exchange rates may vary from one region of a nation to another. There are nations that use limited currencies, which means that their currencies may only be exchanged inside the boundaries of such countries. In these cases, there is often an onshore rate and an offshore rate. The government decides how much a limited currency is worth, and the best place to get a good exchange rate is usually inside a country rather than outside its borders. China is a good example of a nation that has both this rate structure and a currency that is under the authority of the central government. Every day, the Chinese government decides on a figure that will serve as the daily midpoint for the currency and then allows the yuan to trade within a range that is 2% wider on each side of the midpoint.

Macroeconomic: The study of how a whole economy behaves, including its markets, firms, customers, and governments, is the focus of the economics subfield known as macroeconomics. Some of the things that macroeconomics looks at are fluctuations in the unemployment rate, the level of income, the growth rate of GDP, and other economic variables.

GDP growth: The gross domestic product is calculated by adding up all of the product taxes and subtracting all of the subsidies that are not included into the value of the goods. This provides us with the overall money that was generated from the sale of items (GDP). Gross domestic product, or GDP, is the total value of all finished goods and services made in a country. GDP is measured on an annual basis. It is assessed without taking into account issues such as the diminishing availability of natural resources or the wear and tear on manufactured assets.

CHAPTER II

Literature review

Introduction

In this chapter, we will take a look at the many arguments for and against the existence thesis now under discussion.

This chapter is broken down into two sections: the first discusses the theoretical underpinnings, while the second examines the empirical literature. An ending connects the two halves.

Theoretical framework

Quantity theory of Money

In the study that Friedman and Schwartz (1963) conducted on the topic of the monetary history of the United States from the period of the Civil War up to the year 1960, the quantity equation of money served as the analytic foundation. This equation states that the total amount of money equals the total amount of purchasing power. According to this equation, the amount of money corresponds directly to the level of one's purchasing power. In the course of this investigation, the years beginning with the Civil War and continuing all the way up until 1960 were taken into consideration. They argue, among other things, that if there were to be an increase in the money supply (M), then there would be a rise in prices, and this would be due to the fact that more money would be in circulation (P). They conducted an exhaustive investigation into every occurrence in order to demonstrate that Y (the actual output) and V (the velocity) are equivalent. This viewpoint is held by a number of other people (Taylor, 1999).

Pigou is another person who can attest to the truthfulness of this remark (1947). His argument is that even though the labor market is operating at its maximum potential, there has been no change in either the velocity of money (V) or the quantity of transactions (T) that take place in the economy. He makes this claim despite the fact that the labor market is operating at its maximum capacity. It has also been established that an increase in the amount of money accessible, denoted by the letter M , is connected with a rise in the overall price level. This relationship was found by using the general price level as a proxy. The monetarist theory proposes that the behavior in question can be attributed to inflation. Friedman and Schwartz, both well-known monetarists, are of the opinion that an increase in the money supply

might potentially result in an increase in the total price levels of goods and services. This is the opinion that Friedman and Schwartz hold. They hold this opinion because they feel that an increase in the supply of cash would lead to a rise in the total quantity of money that is in circulation. This belief is the basis for their position (1963). This suggests that an expansionary monetary policy that results in an increase in the money supply would, in the long run, result in an increase in prices. This is because an increase in the money supply leads to a higher demand for money (also known as inflation).

The Keynesian theory, which is a modification of the traditional quantity theory of money, retains that the amounts of the monetary base have some kind of transmission mechanism that contributes to their influence on real GDP in a manner that is indirect. This is one of the ways in which the Keynesian approach differs from the traditional quantity theory of money. This is a fundamental principle that underpins the Keynesian economic paradigm. Even though monetarists agree with Keynes that in the short run the economic system is not fully functioning in terms of job creation and that, as a result, growth in monetary policy may be beneficial; monetarists hold the classist point of view that an increase in the money supply would only result in inflation. This is despite the fact that monetarists agree with Keynes that, in the long run, the economy will fully function in terms of employment. Regardless of the fact that monetarists concur with Keynes that full employment would be reached in the economy in the long run, this is the case. Regardless of the fact that monetarists concur with Keynes's prediction that, in the long term, the economy will function at full employment, this is the case. This is the situation despite the fact that monetarists agree with Keynes' prediction that, in the long run, the economy will operate at full employment. The rationale for this is that monetarists are of the opinion that an increase in the total amount of money that is circulating in the economy can only lead to an increase in the prices of all products and services. As a direct result of this, they urge for a change in policy that would make real GDP growth possible while maintaining the status quo of pricing. (LAN, 2008).

The great majority of economists in the modern era are of the opinion that sustained economic growth cannot occur without a gain in productivity. It is essential to have an effective monetary policy as well as an external environment that is supportive of it in order to foster economic development over the long run. In

this context, "adequate liquidity" refers to an interest rate, "interest rates," "strong demand," "modest help from international financial institutions," and "debt rescheduling." For examples, see (Laurence, 2001; Bernanke, 2003).

The Monetarist Theory

The monetarist theory, of which Friedman (1968) was a founding proponent, views a country's money supply as a key factor in its overall economy and its rate of economic growth. In accordance with the monetarist hypothesis, alterations in the supply of money are the primary factor that drives the actions of businesses over the course of time; this behavior, in turn, determines the rate at which economic growth occurs. (Kenton, 2018). The monetarist point of view says that the main reason the economy is growing is because there is more money in circulation. According to this hypothesis, the economy will grow along with the money supply, meaning that more people will spend money, more companies will produce more things, and more jobs will be created (Kimberly, 2018). According to the proponents of the theory, money has an effect on employment and output in the short term, while it has an effect on the price level in the long term (Ahuja, 2011). The view held by monetarists is that the amount of money in circulation is the single most important factor in determining the state of the economy. To add insult to injury, they argue that monetary policies, such as taxation, spending, and borrowing, are less effective than fiscal policies or monetary programs, such as money printing. Their theory, which led them to believe in the necessity of monetary policy, is that national central banks have greater authority than governments do in determining the amount of money that is available in an economy (Kimberly, 2018). According to Khabo (2002), there is a clear connection between the actual economy and the financial sector. National central banks have a large degree of power over the rate at which the economy expands because they have jurisdiction over the instruments of monetary policy, which include the quantity of newly produced money. This gives them authority over the amount of newly created currency. The expansion of a country's economic activity will be accompanied by an increase in the country's money supply.

All regions of the world, developed and developing alike, strive for the same thing: a GDP growth rate that can be sustained indefinitely. Policymakers have struggled to achieve this goal because economic growth is so conditional on a broad range of factors. However, in the past, those in charge of managing the economy

have typically relied on economic indicators such as the money supply and the rate at which general price levels rose to determine the state of the economy. This kind of information can be gleaned from the current price level (Barro, 1995). For instance, the goal of central banks is to preserve price stability while ensuring consistent output growth. They are able to do this through the manipulation of both interest rates and the money supply (monetary policy rates).

Okun's Law and the Phillips Curve, on the other hand, show that once the short-run aggregate supply (AS) curve begins to slope upward, a link is formed between the price level and the output level. This is the case when the Phillips curve is positive. This is in line with the Keynesian model (Mankiw, 2016). This means that while output rises, prices rise and vice versa when output falls. In this scenario, policymakers face an obvious policy dilemma, since they must choose a short-term tradeoff between expanding output and keeping prices steady. Quantity theory ($MV=PY$) predicts, on the other hand, that over the long run, prices will fall in tandem with output. When prices rise, the real money balance falls because of the multiplicative effect of velocity and quantity. In order to keep the money market in its current state of equilibrium, it is necessary to raise interest rates. As a direct consequence of this, both total demand and production have decreased (Mankiw, 2016).

The asset model method contends that an increase in the money supply results in a drop in interest rates, an uptick in investment and aggregate demand, and subsequently an increase in production. This is due to the fact that prices tend to remain relatively stable in the near term. As a result, monetarists believe that the rate of output and the quantity of money will soon be inextricably linked. On the other hand, classical economists hold the view that an easing of monetary policy will lead to an increase in both the overall level of prices and the nominal interest rate but will have no impact whatsoever on the overall level of actual output (Krugman et al., 2018).

Empirical literature

The effect that monetary policy has on the pace of economic growth has been the subject of a significant number of studies, and as a consequence, the academics who have carried out this research have arrived at a broad variety of opinions about the matter. According to Precious and Makhetha-Kosi (2014), the authors intended to

conduct an empirical study between the years 2000 and 2010 to investigate the relationship between monetary policy and the expansion of the South African economy. On a dataset that spanned that time period, they carried out ADF and PP unit root tests in conjunction with ECM in order to achieve this objective. In addition to using ECM, this was also done. According to the results of the research, there is a connection between the total money supply of a nation, the repo rate of the central bank of that nation, the overall rate of inflation in that country, and the value of that nation's currency in comparison to the currencies of other countries. These factors all influence the value of a nation's currency in relation to the currencies of other nations.

It was demonstrated that inflation had a substantial influence on the growth of the economy, although neither the money supply nor the exchange rate did. Neither of these factors had any effect. In addition, Onyeiwu's (2012) investigation into the connection between monetary policy and the growth of Nigeria's economy found that the supply of money (as a stand-in for monetary policy) exerted a significant influence on economic expansion from 1981 to 2008, which Onyeiwu attributed to monetary policy's influence. This influence was felt from 1981 all the way up until 2008. This came to light throughout the course of the inquiry into the relationship between Nigeria's monetary policy and the expansion of the country's economy that the study undertook. These outcomes could not have been achieved without the beneficial impact that expansion-friendly monetary policy had on the economy.

In order to arrive at their findings, Nouri and Samimi (2011) analyzed data spanning the years 1974 to 2008 to investigate the effect that monetary policy had on the growth of Iran's economy. These results show that there is a strong link between Iran's monetary foundation and the country's economy, which is good for both. .

An empirical analysis of the impact that monetary policy has on the rate of growth of Nigeria's GDP was carried out by Fasanya et al (2013) using time series data spanning the years 1975 to 2010. The authors used this data in order to conduct their research. The years 1975 through 2010 were included in the study's scope. They demonstrated that the monetary policy instrument has a major impact, which in turn has repercussions for the industrial sector. The study's results suggested that monetary policy proxies include inflation, foreign reserves, and the currency rate.

According to Mugableh (2019), estimates that were obtained through the use of autoregression distributed lag (ARDL) and vector error correction (VEC) data show

that rates of interest and supply of money have a positive and significant impact on economic expansion both in the short run and in the long run. This is the case for both the short run and the long run. This is the conclusion reached after researching and analyzing data on the relationship between these two factors. This was true both in the near future and in the distant future. The researchers came to another surprising conclusion, which was that the connection between economic growth and monetary policy expansion works in both directions. This is a really interesting finding. Cyrus (2014), on the other hand, evaluated the impact that shocks to Kenya's monetary and fiscal policies had on the country's output. The observations of Kamaan (2014) provide credence to the conclusion reached in the present investigation, which is that monetary policy has very little bearing on the rate of economic expansion. Lashkary and Kashani (2011) evaluated the impact of monetary variables on the growth of Iran's GDP from 1959 to 2008, and they found that monetary policy, as analyzed by the increase in the money supply, had a negligible impact on GDP expansion. This conclusion was reached after the researchers examined the relationship between monetary variables and the growth of Iran's GDP. Their findings can be found in Lashkary and Kashani (2011). This is what the study revealed after examining the role of money in Iran's economic development from 1959 to 2008.

The velocity of economic expansion is said to be affected by changes in monetary policy by monetarists but not to a significant degree by Keynesian economists. Even so, there is not a complete agreement among academics in the published research about the link between monetary policy and economic growth. According to Abille and Mpuure's (2020) investigation of the ARDL model for the years 1983–2017, the money supply of a country has a significant impact on both the long-term and short-term growth rates of that country, while inflation has a significant impact, both positively and negatively, on economic growth across both time frames. These findings, which span the years 1983 to 2017, were compiled with the use of the ARDL model. On the other hand, the interest rates on loans had a virtually insignificant impact on the expansion. According to the findings of Havi and Enu (2014), monetary policy, which was studied through the growth of the money supply, had a favorable and statistically significant impact on the economy of Ghana from 1980 to 2012. This effect was observed from 1980 to 2012. This was the finding that they came to after analyzing the impact that monetary and fiscal policy

had on the economy of Ghana from 1980 to 2012. Based on their analysis of the Ghanaian economy from 1980 to 2012, Havi and Enu (2014) came to this conclusion about the significance of monetary and fiscal policy. Their research covered the period from 1980 to 2012

Isiaka et al. (2011) employed the technique of simple regression to investigate the connection that existed between the expansion of the money supply and the expansion of the economy in Nigeria between the years 1995 and 2004. They discovered that even though there was a positive but not statistically significant long-run association between the two variables, the growth of the money supply was positively correlated with the expansion of the economy. Even though there was a positive long-term link between the two variables, this was still found. The findings of Amassona et al.'s (2011) investigation into the effect that Nigeria's money supply has on a variety of macroeconomic variables are in direct contrast to the findings of their earlier study.

We found an inverse relationship between the two variables by applying a simplified form of OLS on data for each year between 1986 and 2009. To learn how changes in Nigeria's money supply impacted the country's economy through time, Taiwo (2012) used Ordinary Least Square (OLS) as a time series estimation method. The duration of this study's investigation was the research showed that a rise in the monetary aggregate influenced economic growth positively, while a fall in the money stock had a negative impact on GDP growth in Nigeria. According to the findings of their research, an expansion of the supply of money has a significant positive impact on the expansion of the economy. The results of the study that Chinuba, Akhor, and Akwaden (2015) carried out on the economy of Nigeria using simple OLS to predict time series data from 1981 to 2008 demonstrated that a rise in the money supply has an impact on economic development. The research was carried out by Chinuba et al (2015). Using a VAR model, Omotor investigated the short- and long-term effects of Nigeria's supply of money on the growth of the country's economy between the years 1986 and 2006. The data provide credence to the theory that, over the course of a longer period of time, a rise in the money supply encourages faster income growth, whereas over a shorter period of time, this phenomenon has no effect. This viewpoint received backing from the fact that the outcomes were in agreement with the hypothesis.\. An empirical study of the relationship between interest rates, a money supply proxy represented by bank loans,

and GDP was carried out by Adeyeye et al. (2006). The results show that bank loans are significant but counterproductive to economic growth. In order to arrive at a conclusion, the ordinary least square technique was applied on examine yearly data encompassing the years 1970 through 2003. The influence of money supply on economic development in Nigeria was explored by Suleiman (2010). (2010). The study employed the ordinary least square approach and applied secondary yearly data over a period of 37 years, commencing in 1970 and ending in 2007. Based on what he observed, Suleiman (2010) concluded that the quantity of money had a negative influence on Nigeria's real GDP during the time period he looked at.

Kareem et al. (2013) employed the ordinary least squares (OLS) method in conjunction with a correlation matrix in order to study the impact that Nigeria's fiscal and monetary policies had on the rate of economic growth that the country experienced between the years of 1998 and 2008. They came to the conclusion that both restricted money and wide money are significant aspects of policy that make contributions to Nigeria's positive real GDP growth rate. This result was reached after they considered both narrow money and wide money.

In order to calculate MTMs for the East African Community, Davodi et al. (2013) used three different types of structural VARs using monthly data sets covering the years 2000–2010. These data sets were collected from 2000 to 2010. These data sets included years. According to the results of the research, the MTM is much more beneficial when applying non-conventional inference techniques, despite the fact that it is less helpful when using typical statistical conclusions.

An expansionary monetary policy, also described as a "constructive shock" to the reserve currency, has the potential to significantly increase production in Burundi, Rwanda, and Uganda. This is entirely achievable. These three countries are in East Africa. On the other hand, they discovered that an expansionary monetary policy was responsible for the increased production in Burundi, Kenya, and Rwanda after a negative shock to the policy rate. Berg et al. (2013) analyzed the methods by which tropical economies transfer their currencies to four East African nations using the narrative methodology pioneered by Romer and Romer (1989). The region in North America that is circumscribed by the Great Lakes (Uganda, Kenya, Tanzania, and Rwanda). After a significant increase in the short-term interest rate that was generated by policy, they saw a rise in lending and other interest rates, in addition to an appreciation in the exchange rate and a slowing in the development of production.

This provided them with irrefutable evidence that a functional transmission mechanism was already in place.

Utilizing an error correction model (ECM) and data from time series that ranged from 1975 to 2010, Fasanya et al. (2013) conducted an analysis to determine the impact that Nigeria's monetary policy had on the rate of economic growth in the country. The time period included in the study was from 1975 to 2010. The years 1975 through 2010 were included in the scope of this inquiry. According to the findings of their research, the currency rate, inflation rate, and international reserve of the country are key monetary policy instruments that have an impact on the country's economic growth. This conclusion is in line with the theoretical forecast. Evidence for this finding was supplied by correlations that were measured over extended periods of time between the variables. It has come to light that there is not a sufficiently large supply of readily accessible cash.

Onyeiwu (2012) used the ordinary least squares (OLS) method to look at the data and figure out what effect monetary policy had on Nigeria's economy from 1981 to 2008. The time period included in this study was from 1981 to 2008. The data set covered the period from 1981 to 2008. Monetary policy, which he concluded to be the quantity of money that is circulating in the economy, acts as a stimulant for the growth of the economy.

Milani and Treadwell (2012) were able to distinguish the impact of unanticipated and anticipated shocks on monetary policy by using a simplified version of the DSGE model. In order to arrive at an estimate, likelihood-based Bayesian approaches were used to the study of data pertaining to observable variables in the United States, such as the output gap, inflation, and the federal funds rate. They demonstrated that unforeseen monetary shocks have a lesser influence on production for a shorter amount of time, while forecast policy shocks have a much higher impact, although one that is delayed and lasts for a longer amount of time than unanticipated monetary shocks do. There were still a relatively small number of variations in economic conditions that might be linked to modifications in monetary policy.

Chaudhry et al. (2012) used the co-integration technique and the ECM to analyse the long-term and short-term links between Pakistan's monetary policy, inflation, and GDP growth between 1972 and 2010. The study covered the period from 1972 to 2010. They arrived at the conclusion that the variable in monetary

policy that is referred to as "call money" was largely unimportant in the short term, but that in the long run, it played an important role. In order to undertake a study of the transmission of monetary policy mechanisms in Uganda by using a five-variable non-recursive VAR model, Mugume (2011) utilized quarterly data commencing in 1999 Q1 and ending in 2009 Q3 for the duration of the research. These tendencies were the primary focus of the study conducted between 1999 and 2009. According to the results, a shift in interest rates (as measured by the rate on the 91-day Treasury bill) qualifies as a monetary shock. [Citation needed] It has been shown that a contractionary monetary policy may delay economic growth for as long as two quarters, but adjustments to M2 broad money have no statistically significant influence on output. This was determined by substituting the rates on three-month Treasury bills and broad money for those used to determine monetary policy.

Coibion (2011) utilized the standard VAR to examine the substantial impacts produced by Romer and Rømer's approach in order to identify the influence of monetary shocks on the economy of the United States of America from 1970 to 1996. This was done over a period of time spanning from 1970 to 1996. The purpose of this study was to attempt to quantify the effect that shocks to the monetary system can have on the economy of the United States. This comparison was carried out with the intention of establishing the influence that monetary shocks have on the economy of the United States of America, and its primary goal was to achieve this objective. (R and R). The authors came to the conclusion that monetary policy shocks only accounted for a modest percentage of the overall volatility in the real economy when they analyzed the data using the usual VAR approach. This was the conclusion that they reached after analyzing the data. Quantification of these movements was accomplished with the use of variations in industrial output and/or unemployment rates. In addition, it was shown that the typical VAR provided an inadequate explanation for neither the recession that occurred in 1980–1982 nor the recession that occurred in 1990. When Smets and Wouters (2007) were estimating the parameters of their DSGE model, they took into consideration the mild influence that monetary shocks had on real variables like output.

In their study, Jawaid et al. (2011) analyzed yearly time series data from 1981 to 2009 in order to determine the effect that Pakistan's monetary, fiscal, and trade policies had on the state's rate of economic growth. This assessment was made in order to determine how Pakistan's monetary, fiscal, and trade policies affected

Pakistan's rate of economic growth. The researchers looked at the data starting in 1981 and going all the way through 2009. They used co-integration and ECM approaches to show that monetary policy (the quantity of cash in existence) has a great influence, in both the long run and in the short term, on the expansion of the economy. This was shown to be true for both the short term and the long term. This was shown to be true for both scenarios. Senbet (2011) analyzed the relative impact that the United States government's fiscal and monetary policies have on production by employing the VAR methodology. As a result of his investigation, he came to the realization that the expansion of the money supply was a significant factor in the expansion of the economy.

When Adefeso and Mobolaji (2010) researched the impact that monetary and fiscal policies had on the expansion of the economy in Nigeria, the discoveries that they came up with were similar to the conclusions that Adefeso and Mobolaji (2010) popped up with when they explored the topic. Adefeso and Mobolaji (2010) analyzed the annual data that was gathered from 1970–2007 in their study by employing the co-integration method in conjunction with an error-correcting mechanism. This research was published in 2010. These findings are consistent with those obtained by Adefeso and Mobolaji.

Between the years 1974 and 2008, Nouri and Samimi (2011) used the OLS method to investigate whether or not there was a correlation between Iran's money supply and the nation's economic progress. Their investigation included the years 1974 all the way up until 2008. Specifically, the years 2008 and 1974 were the ones that they concentrated on. They were overjoyed to discover that there is a substantial and statistically significant link between the amount of money that is circulating and the growth of the economy.

This gave rise to much excitement among the researchers. Ogunmuyiwa and Ekone (2010) conducted research to determine whether or not there was a correlation between Nigeria's money supply and the country's economic growth from 1980 to 2006. The time period covered by their study was from 1980 to 2006. Throughout this time period, their research focused on the years 1980 to 2006. Evidence of a significant impact of the availability of money on economic growth was found using both the empirical correlation approach and the traditional least squares approach. This influence was found to be present in both the short run and the long run. It was shown that the effects of this impact were beneficial both in the short run and in the

long term. It was discovered that this influence had a positive effect not just in the short term but also in the long term.

In 2010, Moursi and El Mossallamy conducted research into the effects of Egypt's monetary policy on the country's rate of economic growth and inflation. They did this by creating a generic dynamic stochastic equilibrium (DSGE) model for a tiny closed economy using Bayesian methods. Bayesian methods are used to model small, closed economies. This model was utilized to determine the implications that Egypt's monetary policy would have on growth and inflation in order to prepare for those potential outcomes. This model was utilized to investigate the effects of Egypt's monetary policy on the country's growth and inflation rates. This model was used in order to evaluate the effects that Egypt's monetary policies have had on the country's economy. This model was utilized to analyze the impacts that Egypt's monetary policy has had, both on inflation and on the overall economic growth of the country.

Our research used time series data that were gathered on a monthly basis between the years 2002 and 2008. It was found that a negative shock to monetary policy has a far higher effect on production than it does on inflation. This was a very interesting discovery. As a consequence of this, an expansionary monetary policy may support economic growth without substantially affecting the rate of inflation. Amarasekara (2009) utilized recursive VAR and semi-structural VAR approaches on monthly data for the time period encompassing 1978–2005 in order to explore the impact that monetary policy has on growth and inflation in Sri Lanka's small open economy. This investigation lasted from 1978 to 2005. This was done in order to investigate how monetary policy will affect Sri Lanka's relatively large and free-market economy. The investigation lasted from 1978 to 2005. This was done in order to determine how monetary policy affects growth and inflation. The time period covered by this study was from 1978–2005. This was done in order to provide us the opportunity to review the material. The results of the recursive VAR demonstrated, in a manner that was congruent with the findings of the semi-structural VAR, that the interest rate had a detrimental and sizeable influence on growth. The conclusions presented here were supported by the findings of the semi-structural variance analysis. The rate of expansion of the GDP was slowed by positive advances as well. The influence on GDP growth, in contrast, goes counter to popular thinking when money expansion and exchange rates are considered as policy variables. Suleiman

and colleagues (2009) conducted an investigation of the long-term relationship that exists between the supply of money (M2), state spending, and economic growth in Pakistan. They did this by employing the Johnson co-integration test. The annual data used for this study ranged from 1977 to 2007. These researchers examined the data so that they could investigate the long-term association. It was found that the growth of the money supply (M2) has a positive correlation with the development of GDP throughout the course of time.

A VAR model was used by Buigut (2009) in order to evaluate the significance of the interest channel and its level of comparability for EAC nations. This investigation was conducted with the intention of determining the degree to which the transmission mechanisms of the EAC and those of other locations are comparable to one another (Uganda, Kenya, and Tanzania). Because to problems with the data, Rwanda and Burundi were not included. Multiple countries' evaluations, such as the ones done in Uganda (1984–2005), Kenya (1984–2006), and Tanzania (1984–2005), relied on yearly data from a variety of time periods for each of the three parameters (real GDP, CPI, and interest rates) (1984–2006). (1984–2005). (1984–2005). (1984–2005). The data did not provide any proof to support the notion that the variables are co-integrated into a single entity. After reviewing the evidence, he came to the conclusion that a shift in interest rates had no discernable effect on the economies of the three countries.

Based on the autoregressive distributed lag method that was used by Ali et al. (2008) to examine the effects of fiscal and monetary policies on growth in the economy in South Asian nations by using yearly data from 1990 to 2007, they found that the money supply had a beneficial and positive effect on economic growth in both the short term and the long term. This was the case for both the short term and the long term. The money supply had an advantageous and positive effect on economic development. Ali et al. (2008) used annual data from 1990 to 2007 to examine the effects of fiscal and monetary policies on economic growth in South Asian countries. The researchers of the aforesaid study came to this realization during the course of their research. This was the case both in the immediate future and in the distant future. This was true not only for the relatively near future but also for the really far future. This conclusion, which was arrived at as a direct result of the findings of the autoregressive distributed lag model, was reached as a direct result of those findings. A novel VAR identification technique was used by Rafiq and Mallick

(2008) in order to investigate how monetary policy shocks influence production in the three economies that make up the Eurozone: Germany, France, and Italy (EMU3). According to the findings, Germany is the nation that is most susceptible to the effects of shifts in monetary policy among all other nations.

However, it is not obvious whether or not an increase in interest rates coincides with a decrease in output elsewhere in the world other than in Germany. This lends credence to the notion that there is no consistency between the responses. They came to the conclusion that shifts in monetary policy didn't have much of an effect on fluctuations in production within the EMU3.

In order to perform his investigation on the monetary and macroeconomic stability of the nations that make up the West African Monetary Zone, Dele (2007) employed a collection of quarterly data that spanned the years 1991 to 2004. This data was collected throughout the course of his study. According to the findings of the regression analysis, monetary policy, which was analyzed according to the amount of money supply and the credit extended by the authorities, had a negative impact on the real GDP of these countries. This conclusion was reached as a consequence of the fact that monetary policy was evaluated based on these factors. The findings also reject the concept that monetary policy has a negative influence on GDP, and they imply that changes in exchange rates have no effect on the amount of output. The study's findings are in agreement with both of these conclusions. .

Smets and Wouters (2007) built and executed estimations on a DSGE framework for the Eurozone that includes sticky pricing and wages. This model included prices and wages as well as other variables. The estimating was carried out with the assistance of Bayesian networks, and the system was parameterized with the assistance of GDP, consumption, investment, price levels, employment levels, and the nominal interest rate. In addition to this, they included ten orthogonal structural shocks, which made it possible for an empirical investigation to be carried out regarding the importance of such shocks and their contribution to oscillations in the business cycle within the Euro Area. This was accomplished by incorporating ten orthogonal structural shocks. This group made sure to take into account a variety of issues, including but not limited to: productivity, labor supply, investment, choice, cost-push, and monetary policy shocks. Differences in the magnitude and direction of shocks to monetary policy were shown to be a significant factor in the cyclical nature of output in the Eurozone.

In Khabo and Harmse's (2005) study, they applied ordinary least squares analysis to an annual data set covering South Africa from 1960 to 1997 in order to investigate the effects of South Africa's monetary policy according to economic theory. They discovered that the M3 money supply had a strong relationship with both inflation and the expansion of GDP. Bernanke and Gertler (1995) assert that the credit channel is the most reliable mechanism for forecasting the frictions that occur inside the financial system. They arrived at this conclusion as a direct result of this discovery, which was that monetary policy was having a more substantial impact on the actual economy. It is necessary, when attempting to gain an understanding of the influence that monetary policy has on an economic system, to take into consideration the degree of improvement that the monetary system has already attained. This is because the impact that monetary policy has on an economic structure can vary greatly. Because the condition of the economy and the composition of the finance industry are so significant to the accomplishment of the objectives of monetary policy, we shall discuss these topics in this part. Mishra et al., 2012; Carranza et al., 2010; Ma & Lin, 2016). According to Garcia and Liu (1999), a sound financial system stimulates economic growth by motivating individuals to save money at home and subsequently invest that money in the community. To rephrase, a thriving financial system serves as a positive feedback loop that drives expansion. When the financial sector expands, the economy benefits because more money is accumulated and more technological advances are made, as stated by Levine et al. (2000). According to a study released by DFID in 2004, financial development aids in the following areas: savings mobilization and pooling; investment information generation; foreign capital inflow facilitation and encouragement; and resource allocation optimization. The creation of investment data has resulted in all of these advantages. Furthermore, several studies have shown that countries with highly developed financial systems enjoy faster growth rates over longer time spans (Levine et al., 2000).

Using an approach to estimation known as the generalized moment method, Krause and Rioja (2006) looked into the link between economic growth and monetary policy in 37 industrialized and developing countries between the years 1985 and 1998. Their research focused on the period between the years 1985 and 1998. (GMM). There was a total of 37 people who participated in the research. In the course of this particular research endeavor, the years 1985 through 1998 served as

the focal point of attention and analysis. We used private credit, liquid liabilities, and a financial cumulative index that was generated from data obtained from banks and the stock market in order to provide a comprehensive picture of financial development. This index was produced from data received from both financial institutions and the stock market. This index was constructed from data obtained from both sources. They came to the conclusion that the capacity of an economy to put monetary policy into action is considerably aided by the existence of a well-developed financial sector. Carranza et al. (2010) use the total number and depth of financial intermediaries, the degree of activity on the stock market, and the dimensions of the central bank as their primary variables in their research into the link between financial development and monetary policy for 53 different nations spanning the years 1986–2005. This study looks at the relationship between financial development and monetary policy for a total of the years 1986–2005. Because of this, they were able to explore the connection between financial growth and monetary policy as well as measure the growth of the financial sector. Their study covered the decades 1986–2005 and included a diverse group of countries, ranging from those situated in Eastern Europe to those in South America. They approximated using a quasi-cluster analysis, a dynamic panel, and VARIMAX, and they came up with the conclusion that markets benefit more from monetary policy as the finance system becomes more organized, and countries with fewer central banks benefit even more than those with larger central banks. This was the conclusion that they came to after coming to the conclusion that markets benefit more from monetary policy as the financial industry becomes more organized. This was the conclusion that they reached after coming to the conclusion that economies gain more from monetary policy as the financial industry becomes more established. This conclusion is supported by the finding that a boost in the relevance of the implications that monetary policy has on the economies that are being evaluated is correlated with an increase in the level of sophistication of the financial system. In other words, the higher the level of sophistication of the financial system, the more significant the impact that monetary policy has. Singh (2011) investigated monthly data starting in March 2001 and progressing through In October 2011, with the goal of gaining a deeper comprehension of the macroeconomic impact in India as well as the asymmetric impact of interest rate policy on the financial markets of the nation, we conducted research throughout that month. This was done in order to obtain a deeper

understanding of the pass-through effect in India as well as the asymmetric influence that interest rate policy has on the country's financial markets. The researchers began their analysis of the data in March 2001 and continued all the way through October 2011. The author discovered, with the assistance of a distributed lag model, that the short end of the financial sector has a high instantaneous pass through in response to modifications in monetary policy rates. This was one of the findings of the study. Due to the fact that the short end of the market is more sensitive to rate swings, this discovery was made possible. Following careful consideration of all of the information, the author arrived at this conclusion. [Citation needed] Using an approach to estimation known as the generalized method of moments, Krause and Rioja (2006) probed the relationship between economic growth and monetary policy in 37 developed and industrialized nations between the years 1985 and 1998. Their research focused on the period between the years 1985 and 1998. (GMM).

37 people participated in the study as a whole throughout its course. In the course of this particular research endeavor, the years 1985 through 1998 served as the focal point of attention and analysis. We were able to provide an all-encompassing picture of the development of the financial system by making use of private credit, liquid liabilities, and a financial aggregation indicator that was established from data received from banks and the stock market. All of these factors were utilized so that we could provide this information. This made it possible for us to do so. They arrived at the opinion that the presence of an enhanced accounting sector in an economy is a significant component that adds to the capacity of the economy to put money supply into action. This was the result that they came to. They came to this realization as a result of their investigation. In their study on the relationship between financial development and monetary policy for 53 different countries spanning the years 1986–2005, Carranza et al. (2010) use the cumulative size and depth of financial institutions, the level of interaction on the stock market, and the relative size of the central bank as their major factors. This allows them to investigate the link between financial development and monetary policy. Their studies center on the ways in which monetary policy and financial development are connected to one another. They were able to study the link between financial growth and monetary policy as well as assess the expansion of the financial sector as a result of this. Additionally, they were able to measure the expansion of the financial sector. Their study covered the years 1986 to 2005 and included a diverse group of countries, ranging from those

situated in Eastern Europe to those in South America. They approximated using a non-hierarchical cluster analysis, a vibrant panel, and VARIMAX, and they came to the realization that economies benefit more from monetary policy as the finance system becomes more established, and nations with smaller central banks benefit even more than those with larger central banks. This was the conclusion that they reached after reaching this point that economies benefit more from monetary policy as the financial sector becomes more established. This conclusion is supported by the finding that an increase in the significance of the influence that monetary policy has on the economies that are being analyzed is correlated with an increase in the level of sophistication of the financial system. In other words, the higher the level of sophistication of the financial system, the more significant the impact that monetary policy has. Singh (2011) looked at monthly data from March 2001 to October 2011 to learn more about the pass-through effect in India and the different ways that interest rate policy affects the country's financial markets. This was done with the objective of gaining a better understanding of the pass-through effect in India and the asymmetric impact of policy interest rates on the financial markets across the country. This was done in order to obtain a greater comprehension of the pass-through effect in India and the asymmetric effects of interest rate policy on the financial markets of the country. This was done in India. The researchers began their analysis of the data in March 2001 and continued all the way through October 2011. The author discovered, with the use of the structure of a distributed lag model, that the short end of the financial industry has a high instantaneous pass-through in reaction to changes in monetary policy rates. This was the conclusion reached after the author analyzed the data. The author came to the conclusion that the structure of the model was what made this discovery possible. [Citation needed] The author of this model became aware of this fact the moment they put the model's structure into effect. The findings not only revealed the significance of the existing liquidity position in those markets, but they also demonstrated that policy rate adjustments have a considerable impact on the short-term end of the financial market. When we looked at the figures, we were able to verify that this was in fact the case. When contrasted with the other rates, however, the transmission delays for the banks' deposit and lending rates were far more pronounced. The vector autoregressive (VAR) model showed that the transmission of policy rate changes is quite different depending on whether there is a surplus or shortfall of liquidity, especially at the

short end of financial markets. This was demonstrated by the fact that the transmission of policy rate changes is quite different depending on the existence of a surplus or shortfall of liquidity.

Between the years 1985 and 2010, Batuo and Mlambo (2012) conducted research on 53 African nations to determine how the monetary policies of those nations influenced the economic growth of those nations. The researchers estimated the results by utilizing three different methodologies: the Treatment Effect Method, the Two-Step Method, and the Panel Probit Method. According to the findings, banking crises are detrimental to economies, and the frequency of such crises declines as a result of financial deregulation. This suggests that financial deregulation should be encouraged. As a consequence of this, the extent to which a liberalized economy contributes positively to economic expansion is directly proportional to the degree to which the economy has been liberalized. Safdar and Khan (2013) investigated the relationship between Pakistan's growing financial sector and the country's monetary policy by using the interest rate channel as one of their research methods. In order to make an estimate, they utilized the method of ordinary least squares and analyzed quarterly data from the years 1981 to 2010. It was found that one of the channels of the monetary policy transmission mechanism that contributed to the decrease in production was the interest rate channel. This channel deals with interest rates. As a direct result of this reality, developments in the finance industry have an effect not just on output but also on monetary policy. Principal component analysis was used by Angelopoulou et al. (2014) to study the relationship between economic growth and monetary policy in the European Union Area from 2003 to 2011. Their research spanned the years 2003 through 2011, including both years inclusively. The periods 2003 through 2011 were included in the scope of the study, which also included data from those periods. During the course of the investigation, a number of distinct measures, for example the Financial Condition Index (FCI), credit amount, interest rate, and interest rate spread, were utilized. The global financial crisis made it abundantly clear that the financial status index had different consequences across the European Union area. These differences were made apparent by the fact that the index was used. This insight was gained as a direct result of the predicament that we were in.

Ma and Lin (2016) used panel quarterly data for 41 economies between the periods of 2005 and 2011 to conduct their research for their investigation of the relationship

between economic growth expansion and the success of monetary policy. This data was collected during their study of the link between economic expansion and the success of monetary policy. This study was subsequently published in Ma and Lin (2016). Within the bounds of this investigation, the years 2005–2011 were singled out as deserving of special consideration as the primary focus of attention. Throughout the entirety of the research project, they utilized the estimation strategies of pooled least squares, fixed effect, and random effect estimation. Based on the study results, monetary policy has a significant impact not just on output but also on inflation; yet, it has a detrimental effect on the expansion of the economy. The reason for this seeming contradiction is that the Federal Reserve's monetary policy tends to retard the expansion of the economy. The findings of the study led the authors to the conclusion that the efficiency of monetary policy had an inverse relationship with the state of the financial sector. This conclusion was reached as a result of the findings of the study. The findings of the study led them to this conclusion, which they arrived at as a result of their investigation. Using data from a panel of 39 nations and spanning the years 1990–2015, Effiong et al. (2017) investigated the effect of monetary policy on Africa's gross domestic product as well as the continent's inflation rate. The years 1990 through 2015 were the focus of this particular study's time frame. The period beginning in 1990 and continuing through 2015 was covered under the scope of their research. After that, they applied methods for estimating panel data using the information that was at their disposal. The generalized technique of moments (GMM), pooling least squares, fixed effects, and random effects were among these strategies. According to the findings, there was only a shaky link between the achievements of Africa's monetary policy and the general financial prosperity of the continent. Even if there is proof of a negative association between production inflation and growth in general, the results show that there is no mathematical proof of a link between output growth and inflation at contemporaneous levels. This is the conclusion that can be drawn from the study's findings. This is the inference that one is able to draw in light of the results of the investigation. Since 1997, Seth and Kalyanaraman (2017) have been analyzing the impact of financial growth on the transmission of monetary policy in relation to production and bank liquidity, utilizing a panel of 119 countries to do so. Their findings were presented at a conference in 2017. Within the scope of their investigation, they zeroed in specifically on the years 1997–2014. They decided that the ratio of bank deposits to GDP, the capitalization of

stock markets to GDP, and the assets of central banks to GDP would serve as indicators of progress in the financial sector. According to the findings of the study, an expanding financial sector, while beneficial for the overall output of the world's economy, has a detrimental effect on the ability of banks to lend money. They also postulated that the effect of bank liquidity on output would be amplified by increased financial development. This was another one of their hypotheses. Akinsola and Odhiambo (2017) also investigated how Africa's monetary policy evolved from 1980 to 2016 as a direct result of the continent's rapid economic development. Their study incorporated stretches of time at various points. The ratio of liquid liabilities to GDP and the ratio of domestic credit to the private sector to GDP were used as metrics of financial sector growth in the study; both were found to be positively correlated with monetary policy. The dynamic panel data analysis was used as an estimation method. In the banking and capital markets, both of these metrics are used as indicators of the overall health of the economy.

However, the findings were terrible and statistically significant when a "bank crisis dummy" was employed to mimic a financial crisis.

Research on Ghana's monetary transmission mechanism was carried out by Abradu-Otoo et al. Their findings were presented at a conference in 2003 as carried out by Abradu-Otoo, Amoah, and Bawumia. Their findings were presented at a conference in 2003. During the course of the experiment, a method known as structural vector error correction (S-VEC) was utilized, and the M2+ money supply was utilized as the shock variable. The years 1969 through 2002 were included in the research. They found evidence that tools of monetary policy do, in fact, impact output and inflation over the long term. This was a discovery made by the researchers. According to the study's conclusions, the exchange rate channel of Ghana's monetary policy is the most important component of the country's overall monetary policy. The error correction model was utilized by Acheampong (2005) in order to investigate the rate of interest pathway of the monetary policy transmission (ECM). The primary objective of the study was to determine how fluctuations in rates on the money market affect lending and deposit rates, as well as how these rates develop over time. Based on an analysis of monthly data spanning the years 1994 to 2004, the study came to the conclusion that the interest rates in Ghana had a sluggish reaction to changes in the rates on the money market. It was also stated that the adjustment in policy does not have much of an effect on the interest rates that banks charge for

borrowing money, but that it does have some consequences for the decisions that banks make about the interest rates that they charge for lending money. In Ghana, Quartey and Prah (2008) carried out research in order to investigate the connection that exists between the availability of financial resources and the advancement of the economy in the country. They discovered evidence to support the idea that the fundamental drive for the expansion of the financial sector is the growth of the economy. This hypothesis was supported by the data that they uncovered. One of the indicators of financial development, as indicated by the conclusions of the research, is an increase in the proportion of GDP that is represented by broad money. Nevertheless, the authors were unable to discover any evidence to support the assumption that concerns about one's financial situation are the key element in the development of an economy. Kovanen (2011) conducted an analysis of the rate of interest pass-through in the transmission of monetary policy using data that covered the years 2005–2010. This was done in order to conduct the analysis. In the course of the study that was carried out for the purpose of this study, a broad variety of various interest rates were taken into consideration. Interbank rates, prime rates, interest rates on the wholesale market, interest rates on Treasury bills, retail deposit rates, and loan interest rates were all included in these interest rates.

In accordance with the outcomes of the vector autoregressive model (VAR), fluctuations in the prime rate appear to have a strong short-term responsiveness to changes in interest rates on the wholesale market. This is the conclusion reached by the VAR (interbank and Treasury bills). Because of the slow pace at which long-term improvements in the rate of interest on the wholesale interbank market are being played out, the Bank of Ghana is having less success in putting its monetary policy into operation. This is because of the slow pace at which long-term adjustments in the interest rate on the wholesale interbank market are being played out. This is due to the slow pace at which long-term adjustments are being played out, which is causing this situation. There is evidence to support the claim that the prime rate does not necessarily function as a trustworthy indicator of the position taken by the central bank. This view is supported by the fact that the prime rate has been shown to function in this way. These findings are supported by the fact that there have been substantial departures from the policy rate. As a result of this, monetary policy becomes less effective, and the ability of the central bank to convey to the general public its stance on monetary policy is hindered. Adu et al. (2013) conducted

research between the years 1961 and 2010 to determine whether or not there was a correlation between the growth of the economy and the expansion of the financial sector. The study incorporated a total of eight distinct indicators of monetary progress, and the ARDL method was utilized at every stage of the estimation process, despite the fact that it involved eight different indicators. The researchers note that the extent to which economic expansion is impacted by financial development is proportional to the extent of financial development that already exists within the country where the study is being carried out. This is because the authors believe that economic growth is proportional to the level of financial development that already exists. This is due to the authors' belief that the level of financial growth that now exists is related to the level of economic growth that can be achieved. For example, research has shown that broad money (expressed as a percentage of GDP) has a substantial negative impact on the expansion of the economy, whereas loans to the private sector (expressed as a percentage of GDP) have been discovered to have a major positive impact on the expansion of the economy. Both of these factors are expressed as a percentage of GDP. Research was conducted looking into both of these facets in terms of the links they share with GDP. Fiador (2016) conducted research on the topic of the relationship between monetary policy and the expansion of the financial industries in Ghana between the years 1975 and 2011. The research was carried out between the years 1975 and 2011, the Gambia, and Nigeria, which are all countries located in anglophone West Africa. The time period covered was from 1975 to 2011. The years of examination, which ranged from 1975 to 2011, became the core focus of the investigation. An autoregressive distributed lag (ARDL) approach was utilized by the author in order to compile the essential information required for the investigation. According to the conclusions of the research, the attempts that were made by the countries that were investigated to transfer monetary policy did not prove to be successful. Using the example of interest rate pass-through as a point of reference, the findings demonstrated that there are significant differences between the three countries. First, as a reaction to shifts in monetary policy, Ghana and Gambia exhibited signs of excessively low lending rates. This was observed in both countries. Both countries displayed signs and symptoms consistent with these. However, there were indications that loan interest rates in Nigeria were noticeably excessively high.

Ofori-Abebrese and associates (2017) evaluated the growth of the financial sector. They used the ARDL procedure in close collaboration with the Granger causality test to examine whether or not there is a relationship between the growth of the financial sector and the growth of GDP. They found no evidence of a connection between the two. The goal of this study was to investigate whether or not there is a correlation between rising levels of financial development and rising levels of GDP growth in Ghana between the years 1970 and 2013. The findings of the research indicate that there is a correlation between the amount of domestic credit that is extended to the private sector in Ghana and economic growth. On the other hand, there is no such correlation between domestic deposits and economic expansion. The evidence showed that there is only one way in which economic growth is responsible for the domestic deposit. This was shown to be the case by the single finding. These data provided unequivocal support for this interpretation.

CHAPTER III

Methodology

Introduction

This part of our inquiry or research will concentrate on the many methods, processes, or activities that are carried out in order to get vital, informative data for the study. Specifically, we will be looking at how we collect the information. In line with the criteria established by econometrics, these methods, processes, and activities will be the subject of an in-depth discussion as well as a careful examination. This article also discusses the regressors and regressands that were utilized in the process of performing the regression in this research, as well as how and where these variables were acquired. Additionally, the article describes the technique of conducting the regression that was employed in this study. In this part of the article, we will also have a look at and speak about the various statistical techniques that were employed in order to carry out an analysis on the data that was gathered for this research. This analysis was conducted based on the information collected for this research.

Data

1980 was the year that we first started gathering information for this project, and we want to keep doing so for the foreseeable future. This report was compiled with the assistance of the data that was retrieved from the online database that is maintained by the World Bank, which was examined in order to do so. The gross domestic product (GDP), the accessibility of money, the exchange rate, and the rise in prices will each play key roles in the assessment that will be carried out on this topic in the future. Each of the following factors—the total quantity of currency in circulation, the gross domestic product (GDP), the inflation rate, and the exchange rate—will each have a substantial role in the outcome: An investigation into the link between Ghana's monetary policy and the nation's gross domestic product was carried out utilizing economic a priori, statistical, and econometric approaches (GDP). The impacts that a shift in the supply of money could have on the expansion of the economy were studied, and attempts were made to predict those effects.

Table 1.1 Variables and Their Abbreviations

<i>#</i>	<i>Variables</i>	<i>Abbreviation</i>	<i>Measurement</i>	<i>Source</i>
<i>1</i>	<i>Economic growth</i>	<i>EG</i>	<i>GDP growth (annual %)</i>	<i>World Bank</i>
<i>2</i>	<i>Broad money</i>	<i>BM</i>	<i>(% of GDP)</i>	<i>World Bank</i>
<i>3</i>	<i>Real effective exchange rate</i>	<i>REER</i>	<i>index (2010 = 100)</i>	<i>World Bank</i>
<i>4</i>	<i>Inflation,</i>	<i>INF</i>	<i>Consumer prices (annual %)</i>	<i>World Bank</i>

Variables

The entire quantity of money that is currently available within an economy is what economists refer to when they talk about the "money supply." The forms of money that fall under this category include cash and banknotes.

The phrase "money supply" is frequently used in the financial industry to describe a pool of risk-free assets that individuals and corporations can utilize to make payments with or keep as liquid investments. This pool of risk-free assets may also be referred to as "the money supply." This particular interpretation of "money supply" is versatile and can be applied in a variety of settings. In the United States, for instance, the total amount of money that is circulating can be calculated in a diverse range of ways, depending on whether or not one takes into account online fund and document cash, such as the kind that can be identified in checking and savings accounts. In addition, the total amount of money that is circulating can be computed in a variety of different ways in other countries as well, including Australia, Canada, and the United Kingdom. The monetary base, the supply of money at the M1 level, and the money supply at the M2 level are the three most popular methodologies that are used to estimate the amount of the money supply. On the other hand, there are a wide variety of additional approaches that could be used. There is a wide array of different, effective methods to choose from. The total amount of money that is now in circulation as well as the reserves that are maintained by banks are both included in what is referred to as the "monetary base"

(deposits held by banks and other depository institutions in their accounts at the Federal Reserve).

M1 is an abbreviation for "notes and coins currently in circulation," and it refers to the entire quantity of currency that is currently in circulation. This number takes into account the amounts that were deposited for various banking purposes. There are many different kinds of financial companies, some of which are retail banks, savings and loan associations, savings banks, and credit unions. Commercial banks are another type of financial institution. The success of these kinds of financial institutions is largely dependent on the deposits made by their customers.

The sum from M1 is increased by the retailing money sector mutual fund shares, small denomination time deposits, and savings deposits that are part of supply of money M2. The phrase "small-denomination" refers to deposits for shorter terms that are issued in quantities that are less than \$100,000. Both H.3 ("Aggregate Reserves of Depository Institutions and the Monetary Base") and H.6 ("Monetary Aggregates") are published by the Federal Reserve as data sets that address monetary aggregates ("Money Stock Measures").

Economically significant indicators, such as nominal gross domestic product (GDP) and the level of prices, have been shown to have a strong correlation with measurements of the money supply. This relationship has been established. In a great number of different time periods, relationships of this sort have been observed. Some economists, most notably Milton Friedman, have asserted that the money supply not only affects the overall level of prices and inflation over the long run, but that it also provides crucial insight into the near-term direction of the economy. This is one of the more controversial claims made by these economists. The linkages that we have established in the previous paragraph provide some credibility to this line of reasoning. In the past, the Federal Reserve and other central banks have routinely placed a significant amount of weight on monetary policy money supply measurements as a primary source of decision-making information.

In spite of this, during the subject of the preceding few centuries, the United States has demonstrated extremely inconsistent links between the various measurements of the supply of money and things like the increase in GDP and inflation. This is the case despite the fact that the United States has a large money supply. Because of this, the money supply has become less reliable as a main indicator of the success that the Federal Reserve has had in implementing monetary policy in the United States.

The availability of money has consequently become less appealing as a result of this development. The Federal Open Market Committee (FOMC) of the Federal Reserve System keeps up with frequent evaluations of the statistics on the money supply as part of its job in setting monetary policy. These evaluations are performed as part of the Federal Reserve System. The FOMC is tasked with performing these analyses on a continuous basis. However, in addition to the data linked with the money supply, policymakers take into account a wide range of other economic and financial indicators.

Real effective exchange rate: Using a process known as the real effective exchange rate (REER), economists are able to determine how much value one currency holds in comparison to another. It is obtained by dividing a price deflator or index of expenses by the real effective exchange rate, which is a measurement for determining how much something is worth in terms of another currency. This process is known as the deflator method. The term "index of costs" can sometimes be used interchangeably with "price deflator."

An increase in the REER value is consistent with higher prices being realized on exports and lower prices being realized on imports. When REER levels rise, a nation's capacity to compete in global markets often suffers as a direct consequence.

The real effective exchange rate (REER) for a certain currency is the rate at which its value is determined with respect to a particular index or basket of other major currencies. This is referred to as the "determination of the value of the currency of the country in question." The term "real exchange rate" comes from the fact that the weights of the index are set by how each nation's trade balance compares to the balances of the other countries that are included in the index.

If a country's REER is going up, this means that it is getting less competitive in international commerce since the cost of the country's exports is going up while the cost of the country's imports is going down.

Inflation: Economists agree that the change in the value of the Wholesale Price Index expressed as a percentage year-over-year is the most accurate indicator of inflation (WPI). This is accomplished by calculating the yearly percentage change in a basket of goods and services that has been specified in advance. When calculating inflation rates, it is common practise in India to use the WPI as their baseline index.

Alterations in production and distribution costs as well as increases in product taxes are the primary contributors to inflation. One other key factor that contributes to inflation is a mismatch between the amount of money that is demanded and the amount that is available. When there is inflation, which occurs whenever there is an overall increase in the cost of goods and services, the value of a currency will decrease. This is because inflation is caused by widespread price increases. It is also possible for inflation to take place whenever there is an overall increase in interest rates. When economists talk about inflation, they are referring to an increase in the average price level of products and services throughout the economy. Since then, the quantity of products that can be bought with a single monetary unit has steadily dropped. This trend has continued since that time.

The general populations, who are also the customers, are the ones who have been victimized. Consumers are having a harder time affording even the most fundamental necessities as a direct result of the high price of ordinary commodities. Because of this, they are left with little option other than to request a higher salary. In light of this, the government makes a significant amount of effort to maintain the status quo of pricing.

GDP growth: The annualized rate of change in a country's gross domestic product is what is meant to be interpreted as the real economic growth rate for that country (GDP). What economists refer to as a country's "gross domestic product," or GDP, is the sum total of all the commodities and services produced within a specific time period and their market worth.

The rate of inflation is taken into consideration while calculating real economic growth. In light of the fact that inflation plays such a significant part in defining a nation's GDP, doing research on the impacts of inflation on GDP is very necessary. Therefore, the rate of real economic growth is calculated after accounting for inflation and the effect on purchasing power. This is done in order to establish the true growth rate of the economy. Because of this, it is generally considered that it gives a more trustworthy measure of growth than the nominal growth rate does. This is due to the fact that it takes into account inflation.

Broad Money effect on growth

The contractionary impact that high levels of liquidity stress have on bank balance sheets can only be reduced by a considerable rise in the surplus of central bank liquidity available in the Eurozone. If this impact hadn't been reduced, it may have resulted in an abrupt liquidation of assets and a drop in credit, both of which would have had devastating effects on the economy as it exists right now. It was necessary to find a way to mitigate the effect that considerable liquidity stress had on the balance sheets of financial institutions.

Theoretically, the actions of financial institutions to get rid of extra liquidity might be beneficial to asset values and the extension of credit (which, by definition, can only be effective on a macro level). But in an environment in which economic activity has stabilized at a low level, it is highly unlikely that this would translate into an increase in consumer price inflation. The likelihood of this happening is quite low. Because the ECB's strategy is based on two pillars, it is in an excellent position to recognize and respond to indicators of rising inflationary pressure, such as a quicker expansion in money and credit. It's because its two-pillar approach is constructed on two pillars, which explains why this is the case. The European Central Bank (ECB) will continue to use both conventional and unconventional regulation methods to make sure that its monetary policy stance is consistent with its mandate to uphold stable prices in the Euro Area. This is to ensure that the monetary policy stance is coherent with its mandate to maintain price stability in the Euro Area. This is done to guarantee that the attitude of monetary policy is consistent with its mandate, which is to keep prices stable in the Euro Area.

Model specification

Following Jawaid et al. (2011), the economic model for economic development is represented depending on the level of the money supply, inflation, and the actual effective exchange rate, as indicated below:

$$EG = f(BM, INF, REER) \text{ --- (1)}$$

EG is Economic growth, BM is the money supply, INF is inflation, and REER is the real effective exchange rate in equation one (1). The economic model in equation (1) may be represented as an econometric model of Economic growth and money supply and specifying it as follows:

$$EG_t = \beta_0 + \beta_1 BM_t + \beta_2 INF_t + \beta_3 REER_t + \varepsilon_t \quad \text{---(2)}$$

In the equation above which is equation two (2) which represent both GDP and BM respectively, the coefficients β_1 , β_2 , and β_3 , t stands for time, 0 represents a constant term, and stands for an error term.

Description statistic

Informational coefficients are simplified and present a summary of certain collecting data, which can either be a description of the complete population or a selection from that group. Descriptive statistics are a type of information that falls into the latter category. Descriptive statistics are also known as descriptive data. There are two names for descriptive statistics: "descriptive data" and "descriptive statistics." Measurements of central tendency and measures of variability are two subcategories that fall within the statistical category that is referred to as "descriptive statistics" (spread). The average, the median, and the most common example are just three of the ways in which central tendency can be measured. Other methods include the mode and the median. On the other hand, some examples of measurements of variability are the standard deviation, variance, maximum and minimum parameters, kurtosis, and skewness. All of these may be found in the table. In conclusion, descriptive statistics are used to help identify and explain the features of a particular data set by providing concise synopses of the data set's samples as well as the set's measurements. These summaries can be found in tables, charts, and graphs. These summaries are provided in order to assist in the process of defining and comprehending the characteristics of the data set. Those that measure center are the most well-known types of descriptive statistics. These measures, which include the mean, the median, and the mode, are also the types of descriptive statistics that are applied almost widely across all educational levels of statistics and mathematics. The mean, which is also referred to as the average, is calculated by first adding up all of the figures that are included in the data set and then dividing that total by the total number of figures that are included in the set. The result is the mean, which is also referred to as the average.

Stationary Test

The unit root test is used in the field of econometrics to analyze the structure of a time series using an autoregressive model. The goal of this analysis is to determine whether or not the mean and variance of the series have shifted during the course of the observation period. A time series variable is put through the rigors of an autoregressive model when it is subjected to the unit root test, which seeks to ascertain whether or not the variable in question is stationary. The greater use of the improved Dickey-Fuller test may be ascribed to the fact that it can be done with a large number of samples, which contributes to its rising popularity.

ADF and PP Unit Root Tests

When determining whether or not a variable is involved in a unit-root process, Fuller uses an updated version of the Dickey-Fuller test. The constant process hypothesis is an alternative to the null hypothesis, which claims that the variable does in fact have a unit root. This hypothesis proposes that the variable was formed by a constant process. You have the option to leave out the constant and add a word representing the trend instead. As well as including lagging values of the variable's difference into the analysis of regression.

In 1979, Dickey and Fuller devised a technique for testing if a given variable has a unit root or, equivalently, whether it behaves like a random walk. Statistics in Medicine documented the method used. On pages 528 and 529, Hamilton details four situations in which the extended Dickey-Fuller test may be useful. When considering just the null hypothesis, it is always the case that the variable has a unit root. The presence or absence of a drift component in the null hypothesis and the presence or absence of a constant term and a temporal trend in the regression used to generate the test statistic are the key differentiating factors. In Chapter 9 of 2020, Beckett provides more instances and illustrations of how to carry out these tests.

It is assumed that the equation model

$$y_t = \alpha + y_{t-1} + \mu_t$$

where μ_t is a zero-mean error term that is independent and identically distributed. In examples one and two, presumably $\alpha = 0$, corresponding to a random walk with no drift. We allow for a drift term in situations three and four by leaving α unconstrained.

The Phillips-Perron (PP) unit root test was created by statisticians Peter C.B. Phillips and Pierre Perron in 1988. Although the PP unit root test and the ADF test are very comparable to one another, the fundamental distinction between the two is in the manner in which each test handles serial correlation. In contrast to the PP test, which disregards the possibility of any serial correlation, the ADF makes use of a parametric autoregression in order to get a close approximation of the structure of the errors. Despite the distinctions between the two tests, the results of both of them almost always point to the same conclusion

ARDL Bound Test

Numerous previous research have employed the Johansen co-integration technique to find long-term correlations between variables of interest. As a matter of fact, many academics continue to employ this approach because they believe it to be the most precise way to compute I (1) variables. But recent studies by Perasan et al (2001). As a replacement for traditional co-integration methods, I have introduced the "Autoregressive Distributed Lag (ARDL)" bound test. To some extent, this method excels above the Johansen co-integration techniques. M.H. maintains that R.Y. According to Smith (2001), the ARDL method necessitates the following two steps: 1. the first step in determining whether or not there is a trend between the variables of concern is to conduct an F-test. After determining the values of the long-run connection coefficients and estimating them, this research proceeded to predict the short-run elasticity of the variables by the application of an error-correcting representation of the ARDL design. For the purpose of calculating the rate of equilibrium adjustment, the ARDL ECM version will be utilized.

ARDL Model

When analyzing dynamic interactions using time series data, autoregressive distributed lag (ARDL) models are frequently used because such models only require the solution of a single equation. It is allowable for the existing value of the dependent variable to take into account both its own prior realizations (the autoregressive component) as well as the current and historical values of other variables that are used to explain the behavior of the dependent variable. In other words, it is acceptable for the current value of the dependent variable to be an autoregressive component (the distributed lag part). Variables can be either

stationary or nonstationary, or they can be a mix of the two. In order to differentiate between short-term and long-term impacts and to check for cointegration, it is possible to make use of the autoregressive distributed lag model in the form referred to as equilibrium correction (EC). Cointegration is a term that is used to describe the presence of a link between two variables over the long run. These variables are considered to be of interest. By utilizing the equilibrium correction (EC) version of the model, it is possible to successfully complete both of these objectives. This session will offer an introduction to the ARDL Stata command, which can be used to estimate an ARDL or EC template with the optimal number of lags based on the Akaike or Schwarz/Bayesian information criterion. ARDL stands for autoregressive distributed lags, and EC stands for exponentially distributed lags.

The terms "autoregressive distributed lag" (ARDL) and "exponentially distributed lag" (EC) are used interchangeably in this article. Using this command, you can forecast either an ARDL or an EC model with the number of lags that works best for you. You have the option to employ either. We will offer a step-by-step lesson for the Pesaran et al (2001 Journal of Applied Econometrics) limits test for the existence of a long-run relationship, in addition to providing answers to frequently asked questions. This test was published in the Journal of Applied Econometrics in 2001. The results of this test were recently presented in the Journal of Applied Econometrics. This test was first introduced to the public in a paper that appeared in the Journal of Applied Econometrics in the year 2001. This test is carried out through the use of the `stat ectestpostestimation` command, which, in addition to predicting p-values, also contains newly obtained finite-sample critical values. These key values can be applied to a broad variety of distinct model configurations, and they serve as a replacement for earlier tabulations that were discovered in the relevant body of literature. They take into consideration the sample size, the lag order, and the number of explanatory variables, as well as the question of whether or not the elements of the deterministic model are uncontrolled or limited. To estimate the model, the `ardl` command uses Stata's `regress` tool. As a result, specification tests for linear (time series) regressions may be performed using the conventional `postestimation` commands, and dynamic predictions can be obtained using the `forecast` command suite.

ARDL Model Equation

As a result, the ARDL model equation is derived using equation (2) as follows:

$$\begin{aligned}
 \Delta InEG_t &= \alpha_0 + \beta_1 InEG_{t-1} + \beta_2 InBM_{t-1} + \beta_3 InINF_{t-1} + \beta_4 InREER_{t-1} \\
 &+ \sum_{i=0}^q \Delta\alpha_1 InEG_{t-k} + \sum_{i=0}^p \Delta\alpha_2 InBM_{t-k} + \sum_{i=0}^p \Delta\alpha_3 InINF_{t-k} \\
 &+ \sum_{i=0}^p \Delta\alpha_4 InREER_{t-k} \\
 &+ \varepsilon_t \dots \dots \dots 3
 \end{aligned}$$

Error Correction Model

Equation 2 has been adjusted as shown below in order to have the error correction model.

$$\begin{aligned}
 \Delta EG_t = \alpha_0 + \sum_{i=0}^q \Delta\beta_1 InEG_{t-k} + \sum_{i=0}^p \Delta\beta_2 InBM_{t-k} \\
 + \sum_{i=0}^p \Delta\beta_3 InINF_{t-k} + \sum_{i=0}^p \Delta\beta_4 InREER_{t-k} + \lambda ECM_{t-1} \\
 + \varepsilon_t \dots \dots \dots 4
 \end{aligned}$$

Residual diagnostic

This research additionally employs additional diagnostic procedures to ensure the accuracy of the model being tested. White (heteroscedasticity) test, the residual normality test (series correlation test), and the cointegration test are examples of these tests. Displaying the residuals findings against the expected quantities should be used to control the degree of autocorrelation in the dataset. In addition to the value of the residuals, the value of the standardized residual values should be presented against the relationship with the future. This ensures that the degree of autocorrelation in the dataset is kept under control. As a consequence of the F-statistics, we may conclude that the model possesses heteroscedasticity.

Granger causality

The Granger causality test is a statistical hypothesis test that determines whether one time series can be used to estimate another time series reliably. The purpose of this test is to determine whether or not one time series causes the other. Finding out whether or not one time series can accurately forecast the value of another time series is the first step in accomplishing this goal. By analyzing how the two-time series behave with respect to one another, the purpose of this test is to determine whether or not there is a connection between the two. The purpose of this test is to determine whether or not there is a relationship between the two distinct time series by comparing them head-to-head. If the probability's value is lower than any given threshold, then the hypothesis is regarded as invalid at that level. The traditional Granger causality test requires the testing of the null hypotheses that BM does not cause GDP and vice versa, that GDP does not influence BM that REER does not cause INF, and finally that INF does not cause REER. This is done in order to determine whether or not BM causes GDP and vice versa. The purpose of this exercise is to discover whether or not these theories are correct. It is possible to do this by only running the two regression models that are outlined in the following paragraphs:

$$\begin{aligned}
 \Delta InEG_t &= \lambda_0 + \sum_{i=1}^m \lambda_{1i} \Delta InEG_{t-i} + \sum_{i=1}^n \lambda_{2i} \Delta BM_{t-i} + \sum_{t=1}^p \lambda_{3i} \Delta REER_{t-i} \\
 &+ \sum_{i=1}^q \lambda_{4i} \Delta InINF_{t-i} + \mu_t \dots\dots\dots 4 \\
 \Delta InBM_t &= \lambda_0 + \sum_{i=1}^m \lambda_{1i} \Delta InBM_{t-i} + \sum_{i=1}^n \lambda_{2i} \Delta EG_{t-i} + \sum_{t=1}^p \lambda_{3i} \Delta REER_{t-i} \\
 &+ \sum_{i=1}^q \lambda_{4i} \Delta InINF_{t-i} + \varepsilon_t \dots\dots\dots
 \end{aligned}$$

Stability test

It is fairly uncommon for nonlinear models to have parameter instability. As a result, in order to establish whether or not the results are correct, the consistency of the estimated model that was utilized must be investigated. To do this, we use the CUSUM of squares test, which was established by Brown and his colleagues (1975). The model's stability must be examined and double-checked at all times throughout

the estimating process; how much weight you place on the post-estimation test is entirely up to you (Hansen, 2000).

Cusum tests are used in multiple linear regression analysis in order to verify the dependability of the results. The process of inferential reasoning consists of adding up or quadrupling the recursive residuals. Constructing standardized one-step-ahead prediction errors, also known as recursive residuals, requires employing data subsamples from inside the data itself. Values that go outside of the expected range for the sequence provide evidence that the structure of the model has evolved over time, which runs counter to the null hypothesis, which asserts that the parameters have stayed the same during the course of the study.

CHAPTER IV

Result and Discussion

Introduction

This part examines in depth the data analysis strategies discussed in Chapter 3 of this dissertation. The next part will examine and explain data set stationary testing, and the following segment will examine and describe co-integration. This section will examine and explain the stationary test of a data set. In-depth coverage of regression analysis, diagnostic tests, and data or result stability testing will be provided in the last section. This last session of instruction will conclude the course. Even though this happened, the presentation was finished according to the research goals, and all of the software-based E-views assessments were successful.

Descriptive statistic

Table 2.1: Descriptive Statistics

	EG	BM	INF	REER
Mean	4.499379	23.02933	26.66813	283.4570
Median	4.794899	23.64255	18.03144	104.3451
Maximum	14.04712	34.10823	122.8745	3053.704
Minimum	-6.923650	11.30499	4.865398	67.12236
Std. Dev.	3.626380	6.429519	25.10371	567.6425
Skewness	-0.854899	-0.165508	2.565073	3.693556
Kurtosis	5.697696	1.941888	9.930463	16.55276
Jarque-Bera	17.42666	2.099838	127.0141	407.0047
Probability	0.000164	0.349966	0.000000	0.000000
Sum	184.4745	944.2024	1093.393	11621.74
Sum Sq. Dev.	526.0251	1653.549	25207.86	12888718.
Observation	41	41	41	41

Source:(E-Views 12 Author's Computation)

EG has a mean and maximum of 4.499 and 14.04, whereas wide money has a mean and maximum of 23.02 and 34.10. Inflation and exchange rate mean values are 26.668 and 283.45 respectively. And the highest values for both variables are 122.87 and 3053.70, respectively.

Skewness and kurtosis are critical for this test. When looking at the shape of a

distribution, the first thing that stands out is whether or not it has a single mode (peak) or multiple modes. If it is unimodal, which means that it only has one peak, as is the case with the vast majority of data sets, you will be able to determine whether or not it is symmetric or leans to one side. If the majority of the data is found on the left side of the distribution and the right tail is longer, then the distribution is said to be skewed right, also known as being favorably skewed. On the other hand, one might say that the distribution is skewed left, also known as negatively skewed, if the peak is situated on the left and the left tail is longer than the right tail. The normal distribution with a kurtosis of three has been selected as the reference distribution due to the fact that it is the most straightforward option. As a direct result of this, the following justification is frequently provided for excessive kurtosis: "Kurtosis 3 is simply excess kurtosis." The "kurtosis" function in Excel, for instance, actually computes the amount of excess kurtosis. Within the context of a normal distribution, the value of the kurtosis parameter is exactly 3. (Excess kurtosis is exactly 0). Distributions that exhibit a mesokurtic form have a kurtosis that is proportional to the number three (excess 0). An example of a platykurtic distribution with a kurtosis of three (excess kurtosis 0). Its tails are shorter and thinner when compared to a regular distribution, and its pivot peak is frequently lower and wider than it would be in a normally distributed. A normal distribution would have both of these characteristics in common. A normal distribution would have both of these characteristics in common. Normal distributions have tails that are shorter and thinner than those of leptokurtic distributions, which have tails that are longer and fatter than regular distributions' center peaks, which have center peaks that are frequently higher and sharper than regular distributions' center peaks.

ADF Unit Root Test

Table 3.1 Unit Root Test

<i>Augmented Dickey Fuller (ADF) Unit Root Test</i>				<i>PP unit root test</i>		
<i>Variables</i>	<i>Level</i>	<i>1st difference</i>	<i>Order</i>	<i>Level</i>	<i>1st difference</i>	<i>Order</i>
<i>EG</i>	<i>0.4456</i>	<i>0.0000*</i>	<i>I(1)</i>	<i>0.2759</i>	<i>0.0000</i>	<i>I(1)</i>
<i>BM</i>	<i>0.6327</i>	<i>0.0000*</i>	<i>I(1)</i>	<i>0.7668</i>	<i>0.0000</i>	<i>I(1)</i>
<i>INF</i>	<i>0.000*</i>	<i>-0-</i>	<i>I(0)</i>	<i>0.0000</i>	<i>-0-</i>	<i>I(0)</i>
<i>REER</i>	<i>0.0592</i>	<i>0.0000*</i>	<i>I(1)</i>	<i>0.0097</i>	<i>-0-</i>	<i>I(0)</i>

Source: (E-Views 12 Author's Computation)

The unit root test is used in econometrics to assess if the mean and variance of a time series change over a period of time. This test makes use of the autoregressive character of the time series. Using an autoregressive model, the unit root test in statistics establishes whether or not a time series variable is stationary by examining whether or not it has a unit root. The modified Dickey-Fuller test is a multiple-sample test that is used rather often.

The previous calculation of the ADF unit root shows that, with the exception of inflation, all of our parameters are stationary at the beginning difference. The variable that measures the rate of inflation is the only exception to this rule. Because the p values for the BM, EG, and REER at the first difference are all 0.0000 and the p value for the INF at the level is likewise 0.0000, the ARDL model was chosen for the study because all of these metrics have the same value.

The result for the PP unit root test shows that two variables are stationary at level, they are inflation and real effective exchange rate, while two of the variables are stationary at 1st difference and they are economic growth and broad money.

ARDL Bound Test

Table 4.1 Bound test

<i>Model</i>	<i>Lag.</i>	<i>F-Statistic</i>	<i>Decision</i>
			<i>Co-Integration</i>
<i>EG, REER, INF, BM</i>	<i>(1, 0, 0, 1)</i>	<i>6.103444***</i>	<i>Exist</i>
<i>Bound Value</i>	<i>Critical</i>		
		<i>I(0)</i>	<i>I(1)</i>
<i>Sign.</i>	<i>10%</i>	<i>2.2</i>	<i>3.09</i>
	<i>5%</i>	<i>2.56</i>	<i>3.49</i>
	<i>2.5%</i>	<i>2.88</i>	<i>3.87</i>
	<i>1%</i>	<i>3.29</i>	<i>4.37</i>

Source: Akaike Info criterion; 1%*** significant

To determine whether or not two variables are cointegrated, one method that can be utilized is known as the augmented autoregressive distributed lag (ARDL) limits technique. A second F-test is performed on the lagged levels of the independent

variable(s) in the ARDL model using this methodology. If cointegration is present, the results of the test will indicate that it is present. As a means of putting this testing strategy into action, the bootstrapping method was initially proposed as a solution. The findings of a test of cointegration are presented in the table that is located just above this one. You may access it by clicking on the tab labeled "Cointegration Test Results." When measured against a significance level of 1%, it is extremely clear that the F-statistic value of 6.103444 exceeds the upper critical limit. This conclusion can be reached after comparing the two values. Because of this, it may appear as though the variables that explain growth in the economy have an effect that is felt for an extended period of time. This demonstrates that there is a connection between the variables that are located in different areas through a process known as co-integration.

ARDL Short and Long run tests

Table 5.1 ARDL Short Test

	Short run	
Variable	Coef.	P value
EG	0.0705	0.6831
BM	0.2685	0.0916
INF	-0.01528	0.5488
REER	-0.00401	0.0028***
C	--	--
ECM	-0.929478	0.0000

6.1 ARDL Long-Run

Variables	Coef.	P value
BM	0.0122	0.8805
INF	-0.016441	0.5428
REER	-0.004323	0.0009****
C	6.018616	0.0087

*Source: Akaike Info criterion; 1%*** 5** 10*significant*

The findings of the research, both long-term and short-term, are presented in the table that can be seen up above, and they make it clearly clear that there is a link between the independent factors and the variable that is being studied (the dependent variable).

Tiny variations in the money supply might potentially have a positive influence on economic development in Ghana, whereas significant movements in the exchange rate can potentially have a negative impact, and similarly, small shifts in inflation can potentially have a similarly negative impact. When N is taken into consideration, this conclusion makes perfect sense. M. Using experimental methodologies and time series data spanning from 1973 to 2013, Gatawa's (2017) research investigated the link between the increase of Nigeria's gross domestic product (GDP), inflation, and interest rates. Within the context of an error-correction framework, the VEC model employs the VAR Model and the Granger Causality Test to demonstrate that a high money supply is beneficial for growth, but inflation and interest rates are detrimental to growth over the course of a longer period of time. In the near term, the findings of the careful analysis revealed that, with the exception of inflation, an increase in the money supply or a fall in interest rates would have a negative influence on the development of the economy. This conclusion was not supported by the test of causality, despite the fact that it was shown that money supply, inflation, and interest rates had no influence on the expansion of the economy. According to the findings of the research, an expansionary monetary policy and financing based on zero interest should be implemented in order to both boost investment in the real sector of the economy and stop the inflationary tendency that is related to monetary policy. In addition, the ECM's rate of adjustment from the short run to the long run is quite quick, clocking in at 92%.

Residual Diagnostic Tests

Table 7.1 Residual Diagnostic Tests

<i>Tests</i>	<i>Statistic</i>	<i>P value</i>
<i>Breusch Godfrey LM test (Serial correlation)</i>	<i>0.4339</i>	<i>0.6084</i>
<i>Normality</i>	<i>13.53598</i>	<i>0.001150</i>
<i>Heteroscedasticity</i>	<i>0.197442</i>	<i>0.7836</i>

Source: (E-Views 12 Author's Computation)

This research employs additional diagnostic tests to evaluate the model's reliability. These tests include the White (heteroscedasticity) test, the residual normality test (series correlation test), and the cointegration test. To manage the degree of autocorrelation in a dataset, the results of the residuals should be shown against the predicted values. In addition to the value of the residuals, the value of the standard residual values relative to the future should be supplied. This guarantees that the dataset's autocorrelation is maintained under control. By looking at the F-statistics, we can tell that the model has heteroscedasticity.

According to the data in the table, the residuals lack serial correlation, conditional heteroskedasticity, and normal distribution. In reality, the residuals lack a normal distribution.

The null hypothesis indicates that serial correlation does not exist, while the alternative hypothesis indicates that serial correlation does exist in the model. The probability value of 0.6084 exceeds the minimum requirement of 0.05%. So, we accept the null hypothesis and say that there is no serial correlation in the model.

In particular, the heteroskedasticity test's null hypothesis suggests that there is no heteroskedasticity in the model at the 5% level but that it becomes stationary at the 10% level. Based on the residual diagnostic test, the probability value of 0.7836 is greater than the threshold of 0.05 percent, indicating the severity of the problem. Therefore, we cannot reject the null hypothesis at 5% and infer that the model does not display heteroskedasticity. But at 10%, we may decide that the null hypothesis is wrong and say that the model has heteroskedasticity.

The null hypothesis shows that residuals are not normally distributed at 5%, but the alternative hypothesis shows that residuals are regularly distributed. The probability of 0.001150 Jarque-Bera is less than 0.05 percent. Accepting the null hypothesis, we conclude that residuals are not normally distributed at 5% but become statistically significant at 10%.

Pairwise Granger Causality Test

Table 8.1 Granger Causality Test

Null Hypothesis	Obs.	F-Statistic	Prob.
BM does not Granger Cause GDP.	39	0.47190	0.6278
GDP does not Granger Cause BM		0.82876	0.4452

INF does not Granger Causes GDP	39	2.64249	0.0858
GDP does not Granger cause INF		9.96778	0.0004**
REER does not Granger Cause GDP	39	1.21894	0.5629
GDP does not Granger Cause REER		4.86558	0.0139**
INF does not Granger Cause BM	39	1.29346	0.2929
BM does not Granger Cause INF		0.67480	0.5159
REER does not Granger Cause BM	39	1.68985	0.1997
BM does not Granger Cause REER		0.53663	0.5896
REER does not Granger Cause INF	39	6.92219	0.0030**
INF does not Granger Cause REER		19.4354	2.E-06

Source: (E-Views 12 Author's Computation)

The results show that there is a cause-and-effect link between the variables that works both one way. Inflation and economic growth exhibit evidence of a one-way chain of causation; more specifically, at the 5% level, economic growth granger cause inflation, but inflation does not. At the level of 5% of a significant economic growth granger cause exchange rate but exchange does not. There is a correlation that may be understood as unidirectionally causal when the level of significance is set at 5% between the real exchange rate and inflation. This correlation exists when the threshold of significance is set at 5%. Nonetheless, inflation is not the primary driver of the real exchange rate. Other factors come into play. However, inflation is not the most important element in establishing the real exchange rate; rather, the real exchange rate is the most important factor in inflation.

Stability Tests

Figure 1.1 CusumTest

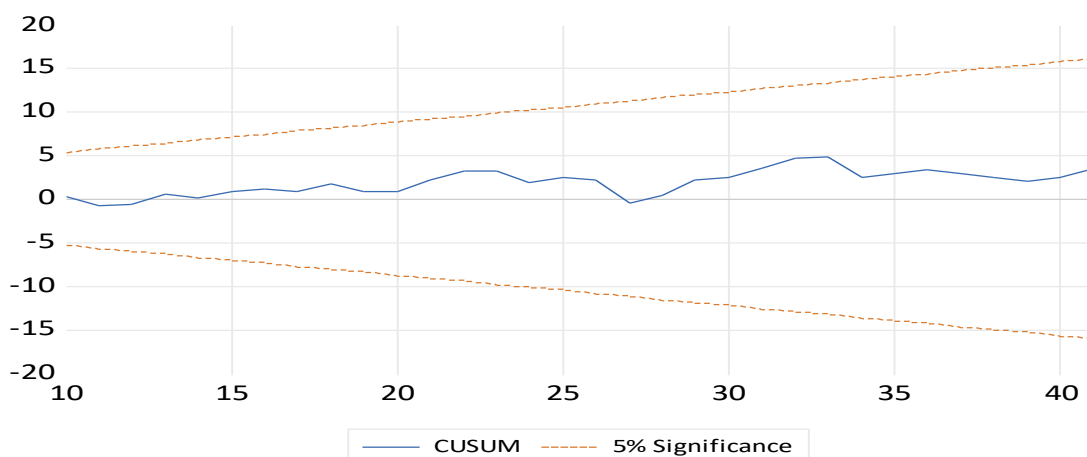
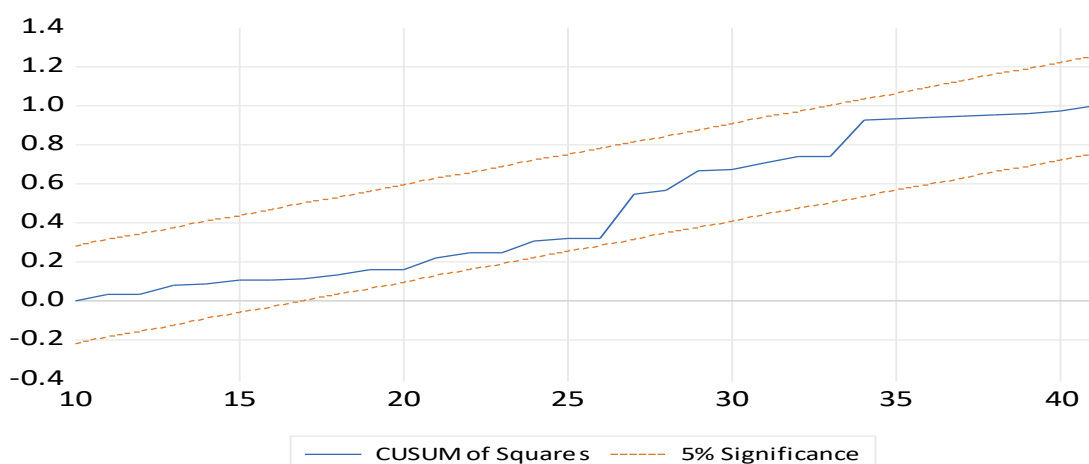


Figure 2.1 Cusum of square

Parameter instability in nonlinear models is quite unusual. In order to determine whether or not the findings are accurate, it is necessary to analyze the consistency of the employed approximate model. Brown and his colleagues developed the CUSUM of squares test, which we utilize for this purpose (1975). Throughout the estimate process, the model's stability must be inspected and double-checked; how much weight you put on the post-estimation test is completely up to you (Hansen, 2000).

In multiple linear regression analysis, cusum tests are used to evaluate the consistency of the findings. The null hypothesis says that the parameters have stayed the same, but values outside of the expected range for the sequence show that the model's structure has changed over time.

Also, the fact that the blue line for both CUSUM and CUSUM of square is between the two red lines shows that the data are stable.

CHAPTER V

Overview, Conclusion and Recommendations

Overview

The goal of this study is to find out how Ghana's monetary policy, exchange rate, and inflation have all affected the country's economic growth over the course of this research project.

According to the International Monetary Fund (IMF), Ghana is among the few nations in sub-Saharan Africa to have satisfactorily adopted a fully integrated system of floating exchange rates, liberalized its external sector, and sustained a relatively high growth rate of gdp for more than a decade. Additionally, Ghana is one of the few countries in the world to have maintained a reasonably high real GDP growth rate for more than a decade. In addition to this, Ghana is one of the few countries in the world that has managed to keep a reasonably high rate of real GDP growth for more than a decade. In addition to this, Ghana is one of the few countries in sub-Saharan Africa that has liberalized its commerce with the world at large in its external sector. This was accomplished in Ghana's attempt to become more economically competitive. The International Monetary Fund (IMF) points out that Ghana's real GDP has grown at a fairly high rate for more than a decade, which is one reason why the country is thought to be doing well economically. Compared to the time before the reforms, inflation in Ghana has dropped significantly; nonetheless, the rate of inflation is still very high and unpredictable, making it a difficult problem for the administration of the nation. This is one of the issues that has proven to be difficult. The monetary policy framework in effect during the reform period was known as "monetary aggregate targeting," and the monetary authorities faced substantial problems in trying to accomplish their aims (Dordunoo and Donkor, 1998). Throughout the period of reform, two features of the Ghanaian economy dominated the country's money supply process. According to the study, these factors are the key contributors to the country's inflationary cycle. These are rising capital inflows as well as budget deficit financing.

It is probable that the relative significance of these variables has evolved over time as a consequence of the significant increase in cash inflows, which have primarily arrived in the form of remittances and gifts from other countries. This is particularly significant given that Ghana adopted this structure throughout the time period. In fact, determining which part of the money supply is dominant is a considerable

difficulty for monetary officials operating within such a framework. In Ghana, scholarly and policy debate has focused on the role that incoming money and deficit finance, most notably donations from other countries, have in the economy (for example, see Leith and Soderling, 2000; Younger, 1992; Tsikata, 1999; Dordunoo and Donkor, 1998; Addison, 2001; and Sowa, 2004). Authors such as Leith and Soderling (2000) and Younger and Tsikata have, throughout the course of time, referenced the significant increase in the amount of money that came into the country, mostly in the form of remittances and gifts from other nations. Because of this, the fundamental objective of this research is to carry out an empirical investigation of the various roles that each of these constituents has had in the development of the money supply ever since the reforms were first put into effect. This study investigates the factors that ultimately lead to the observable aggregates of monetary data. An empirical knowledge of the primary sources of money supply is essential for effective inflation management, particularly within the context of the monetary targeting framework that was established in post-reform Ghana. This is especially true when considering the context of the monetary targeting framework. This is of utmost significance when taking into consideration the fact that Ghana preserved this structure throughout the period. Within the confines of such a structure, it is very difficult for monetary authorities to determine which aspect of the money supply is the most significant. The consequences of fiscal deficit financing and capital inflows, most notably international assistance, have been the focus of a significant amount of scholarly and policy discourse in Ghana. This discourse has been centered on the country's quest to improve its economic performance. The impacts of fiscal deficit financing and capital inflows have been the primary focus of this conversation up until this point (for example, see Leith and Soderling, 2000; Younger, 1992; Tsikata, 1999; Dordunoo and Donkor, 1998; Addison, 2001; and Sowa, 2004). It has been hypothesized that the main factors of monetary growth and, as a consequence, the inability of monetary authorities to maintain inflation have been fiscal deficit funding and foreign currency inflows (for example, see Leith and Soderling (2000), Younger (1992), and Tsikata (1999)). This is because fiscal deficit financing and foreign currency inflows have been the primary drivers of monetary expansion. Several academics, such as Leith and Soderling (2000), Younger (1992), and Tsikata, have proposed this notion as an explanation for the phenomenon (1999).

This article makes use of a device that is commonly referred to as the money multiplier in order to do research on the topic at hand.

In addition, an innovative method of co-integration called the "Autoregressive Distributed Lag (ARDL)" bound test was used in this thesis. This strategy provides a number of benefits in comparison to the Johansen co-integration methods, and this thesis explains how those benefits might be used.

At the 1% confidence level, the F-statistic result of 6.103444 is much higher than the upper critical limit, which shows that there is a long-run connection between economic development and the causes that explain it. The results of the cointegration test may be seen in the table that can be found directly above this one. Simply clicking on this link will grant you access to it.

The table that came before it demonstrates that there is a relationship between the variables that are dependent on one another and the variables that are independent of one another, and that this link may be either lasting or transitory. These results, along with those obtained by N, are consistent with one another. According to the findings of the investigations carried out by M. Gatawa (2017), there was a negative significant connection between the economy's growth and the exchange rate in Nigeria between the years 1973 and 2013. This was the conclusion reached as a result of the research that was conducted. It was also found that a positive association existed between the amount of money in circulation and economic expansion, as well as a positive relationship between inflation and economic growth. It was discovered that each of these discoveries is accurate.

In addition to this, the ECM has a significant adjustment speed of 92% while moving from the short term to the long term. In order to determine the model's reliability; this research employs additional diagnostic tests. White (heteroscedasticity) test, the residual normality test (series correlation test), and the cointegration test are among these tests. To regulate the degree of autocorrelation in a dataset, the residual findings should be compared to the expected values. In addition to the residual values, the standard residual values related to the future should be provided. This ensures that the dataset's autocorrelation remains under control. We can determine that the model exhibits heteroscedasticity by looking at the F-statistics.

The residuals lack serial correlation, conditional heteroskedasticity, and normal distribution, according to the data in the table. It turns out that a normal distribution

cannot be assumed for the residuals. In the model, serial correlation is not assumed to exist according to the null hypothesis; nevertheless, according to the alternative hypothesis, serial correlation is assumed to be present. The value of the likelihood, which was calculated to be 0.6084%, is higher than the required minimum value of 0.05%. As a result, given that we are going to go ahead and accept the null hypothesis, we are going to assert that the model does not incorporate any form of serial correlation.

In this particular scenario, the null hypothesis for the heteroskedasticity test states that the method does not demonstrate heteroskedasticity at the 5% level of significance but does so at the 10% significance level, at which point it becomes stationary. This, however, is not the case. Instead, the heteroskedasticity test demonstrates that the model does exhibit heteroskedasticity at the 10% significance level. In contrast to this, the alternative hypothesis asserts that the model does, in fact, demonstrate heteroskedasticity at the 5% level of significance. Because the probability value of 0.7836 is more than the threshold of 0.05 percent that was used in the residual diagnostic test, the level of severity of the issue may be determined by looking at this statistic. Therefore, at the 5% level of significance, we are unable to draw the conclusion that the model does not exhibit heteroskedastic behavior. On the other hand, if the significance threshold is more than 10%, we can come to the conclusion that the model is heteroskedastic.

At the 5% significance level, the alternative hypothesis demonstrates that residuals follow a normally distributed distribution, while the null hypothesis demonstrates that they do not follow a normally distributed distribution. There is a less than 5% chance of seeing a Jarque-Bera value of 0.001150. In the case that the null hypothesis is found to be true, our findings indicate that the residuals do not follow a normal distribution at a significance level of 5%, but there is a significant difference between the two levels at the 10% level.

In nonlinear models, parameter instability is exceptional. To evaluate whether the results are correct, the consistency of the approximation model used must be examined. Brown and his colleagues created the CUSUM of squares test, which we use in this case (1975). The model's stability must be evaluated and double-checked throughout the estimation process; how much weight you place on the post-estimation test is entirely up to you (Hansen, 2000).

Cusum tests are used in multiple linear regression analyses to assess the consistency

of the results. Inference is performed using sums recursive residuals and squared recursive residuals are subjected to additions and subtractions respectively. The recursive residuals, also known as the standard errors of the one-step-ahead predictions, are computed by first dividing the data into larger samples and then into even smaller ones. The assumption that there is no influence is known as the null hypothesis parameters have remained constant, while numbers outside of the predicted range for the sequence indicate that the structure of the model has changed over time.

Furthermore, the blue line for both the sum and the sum of squares is between the two red lines, indicating that the data are stable.

Conclusion

The decision-makers in Ghana need to have access to reliable data regarding the effects that shifts in the supply of money, its exchange rate, and rising prices have on the rate of economic expansion. In this study, we look at the interrelationships between the variables and conduct an econometric analysis to uncover the nature of this connection.

The econometric analysis made use of the ARDL cointegration and error-correction techniques. This study provided more evidence that inflation, money supply, and the exchange rate are all interconnected in the long term.

Due to the rapid increase in monetary inflows, most of which have come in the form of remittances and gifts from other countries, the relative significance of these elements is likely to have fluctuated over time. As a result, the primary goal of this research is to carry out an empirical examination of the various functions that each of these parts has played in the development of the supply of money ever since the reforms were initially put into place. This investigation will be carried out in order to fulfill the principal objective of this study, which is to carry out the foremost objective of this study, which is the goal of this research is to figure out what makes up the easy-to-measure financial aggregates. For Ghana's monetary targeting system, which was put in place during the reform era, to be able to control inflation effectively, it is important to know where the money comes from. This is significant since this architecture was in use during the whole time in Ghana. However, it is a substantial issue for monetary authorities operating within such a framework to determine which element of the money supply is preponderant. The long- and short-

term correlations between the dependent and independent variables are shown in the table above.

Money supply is little but positively affects economic growth in Ghana, whereas the exchange rate is large but negatively affects growth, and inflation is negligible but negatively affects growth. Using data from 1973 to 2013, this study looked at how Nigeria's money supply, inflation, and interest rate have affected the overall performance of the country's economy. Using the VAR model and the Granger causality test within an error-correcting framework, the VEC model comes to the conclusion that a high money supply significantly impacts growth, whereas inflation and interest rates affect growth negatively over the long run. This finding is based on the assumption that the VAR model and the Granger causality test are both accurate. The cautious short-run analysis revealed that, with the exception of rising prices, broad money supply and interest rate were negatively related to GDP growth. This was the case regardless of whether or not inflation was present. It made no difference whether or not there was inflation because this was always the case. The causality test results show that monetary policy factors such as money supply, inflation, and interest rate have no effect on economic growth. As a result, "expansionary monetary policy" and "zero-interest financing" were proposed as potential methods of enticing investment in the real sector of the economy without enabling monetary policy to cause inflation. Both of these ideas are aimed at preventing monetary policy from causing inflation. The ECM also boasts a rapid 92% adjustment speed between the short and long term.

Here, we use further diagnostic procedures to check the model's accuracy. Three such tests are the residual normality test (series correlation test), the cointegration test, and the White (heteroscedasticity) test. Managing the level of autocorrelation in a dataset requires comparing the residual findings to the expected values. Expected future standard residual values should be supplied in addition to the residual values. This ensures that the dataset's autocorrelation remains manageable. Heteroscedasticity in the model is evident from the F-statistics.

The table shows that the residuals do not follow a normal distribution, have serial correlation, or are subject to conditional heteroskedasticity. The residuals do not have a normal distribution in practice.

In contrast, the alternative hypothesis contends that the model in question does, in fact, show serial correlation, whereas the null hypothesis maintains that none

do. As can be seen, the value of the probability is greater than the threshold value of 0.05%, which indicates that the probability value of 0.6084 is higher. Since this is the case, we will assume (the null hypothesis) that the model does not have any kind of serial correlation.

The heteroskedasticity test's null hypothesis in this example shows that the model is stable at the 10% level but has no heteroskedasticity at the 5% level. The severity of the issue is indicated by the residual diagnostic test, which returns a probability value of 0.7836, which is more than the 0.05 percent threshold. Thus, a 5% significance level for rejecting the null hypothesis would not be sufficient to prove that the model is free of heteroskedasticity. However, if the significance level is 10% or above, we may conclude that the model possesses heteroskedasticity and reject the null hypothesis.

Residuals are not regularly distributed within a 5% confidence interval, as the null hypothesis predicts. Below 5%, the probability of a 0.001150 Jarque-Bera is negligible. If the null hypothesis holds, then the residuals are not normally distributed at a significance level of 5% but are statistically significant at a level of 10%.

Nonlinear models seldom suffer from parameter instability. Validity of results relies on checking the internal consistency of the approximation model used. Here, we make use of a test called the CUSUM of squares, which was developed by Brown and his colleagues (1975). The stability of the model must be evaluated and rechecked at many points in the estimate process; how much weight the post-estimation test is given is entirely up to the individual (Hansen, 2000).

Findings in repeated linear regression investigations may be checked for reliability using cusum tests. Inference is performed using sums and squares of recursive residuals. Standardized one-step-ahead prediction errors, or recursive residuals, are derived by splitting the data into smaller samples and utilizing that information to make predictions. If the parameters are found to be within the predicted range of the sequence, then the null hypothesis holds, whereas any values outside of that range indicate that the model structure has changed.

In addition, the blue lines representing the sum and the sum of squares fall inside the boundaries established by the red lines, indicating the stability of the data.

Recommendations

If policymakers want to reduce the influence of the money supply on inflation, as the data suggest they should, central bank independence is essential. Limits on the central bank's ability to create new currency to pay off government debt would result from the Bank of Ghana's autonomy. Even more convincing is the success of the current inflation policy, known as "inflation targeting," which countries like the United Kingdom and Sweden, who put a premium on central bank independence, have embraced.

According to the research results, the financial management of national as well as global corporations should keep a close eye on price increases, the monetary policy rate, the current account balance, the money and quasi-money supply as a percent of gross domestic product, the per capita growth rate of GDP, and the exchange rate. These factors all play a role in the overall economy. All of these factors can have a significant impact on the economy. As inputs into economic decisions that are being made during trade negotiations, these and other criteria may be considered together with others in order to maximize shareholder profit. Importers, exporters, and financial middlemen may look at macroeconomic trends to predict how currency rates will move. This can help them choose the best internal management strategy to lower exchange rate risk.

The research also demonstrates a trade-off between production and inflation, which is consistent with the results of Asafu-Adjaye (2008), indicating that inflation may be controlled to some extent by maintaining output around its potential level. This trade-off may also imply that, if not well managed, the goal of single-digit inflation may hinder economic progress. In line with what has come before, this study backs the suggestion that the Bank of Ghana should focus on real sector variables like employment and investment, which can not only help the economy grow but also reduce poverty. One of these initiatives is to lower the cost of borrowing for the private sector since their activities contribute so much to Nigeria's economic development. When interest rates on borrowing are not suffocating, the private sector will spend more, allowing for additional production and employment possibilities. The report also suggests that the Bank of Ghana devise strategies to guarantee that monetary policies on money supply are favorable enough to boost economic growth in Ghana.

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Appendix

Appendix 1: Descriptive Statistic

	GDP	INF	REER	BM
Mean	4.499379	26.66813	283.4570	23.02933
Median	4.794899	18.03144	104.3451	23.64255
Maximum	14.04712	122.8745	3053.704	34.10823
Minimum	-6.923650	4.865398	67.12236	11.30499
Std. Dev.	3.626380	25.10371	567.6425	6.429519
Skewness	-0.854899	2.565073	3.693556	-0.165508
Kurtosis	5.697696	9.930463	16.55276	1.941888
Jarque-Bera Probability	17.42666 0.000164	127.0141 0.000000	407.0047 0.000000	2.099838 0.349966
Sum	184.4745	1093.393	11621.74	944.2024
Sum Sq. Dev.	526.0251	25207.86	12888718	1653.549
Observations	41	41	41	41

Appendix 2: Unit root test

GDP

Null Hypothesis: GDP has a unit root

Exogenous: None

Lag Length: 4 (Automatic - based on AIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-0.611142	0.4456
Test critical values:		
1% level	-2.630762	
5% level	-1.950394	
10% level	-1.611202	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(GDP) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.900877	0.0000
Test critical values:		
1% level	-3.610453	
5% level	-2.938987	
10% level	-2.607932	

*MacKinnon (1996) one-sided p-values.

BM

Null Hypothesis: BM has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.272946	0.6327
Test critical values:		
1% level	-3.605593	
5% level	-2.936942	
10% level	-2.606857	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(BM) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.444720	0.0000
Test critical values:		
1% level	-3.610453	
5% level	-2.938987	
10% level	-2.607932	

*MacKinnon (1996) one-sided p-values.

INF

Null Hypothesis: INF has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.847269	0.0003
Test critical values:		
1% level	-3.605593	
5% level	-2.936942	
10% level	-2.606857	

*MacKinnon (1996) one-sided p-values.

REER

Null Hypothesis: REER has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.859375	0.0592
Test critical values:		
1% level	-3.605593	
5% level	-2.936942	
10% level	-2.606857	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(REER) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-7.992493	0.0000
Test critical values:		
1% level	-3.610453	
5% level	-2.938987	
10% level	-2.607932	

*MacKinnon (1996) one-sided p-values.

PP UNIT ROOT TEST

Null Hypothesis: GDP has a unit root
 Exogenous: None
 Lag length: 4 (Spectral OLS AR based on AIC, maxlag=9)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-1.008889	0.2759
Test critical values:		
1% level	-2.624057	
5% level	-1.949319	
10% level	-1.611711	

Null Hypothesis: D(GDP) has a unit root
 Exogenous: None
 Lag length: 3 (Spectral OLS AR based on AIC, maxlag=9)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-16.21697	0.0000
Test critical values: 1% level	-2.625606	
5% level	-1.949609	
10% level	-1.611593	

*MacKinnon (1996) one-sided p-values.

BM

Null Hypothesis: BM has a unit root
 Exogenous: None
 Lag length: 0 (Spectral OLS AR based on AIC, maxlag=9)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	0.296869	0.7668
Test critical values: 1% level	-2.624057	
5% level	-1.949319	
10% level	-1.611711	

Null Hypothesis: D(BM) has a unit root
 Exogenous: None
 Lag length: 0 (Spectral OLS AR based on AIC, maxlag=9)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-6.436527	0.0000
Test critical values: 1% level	-2.625606	
5% level	-1.949609	
10% level	-1.611593	

*MacKinnon (1996) one-sided p-values.

INF

Null Hypothesis: INF has a unit root
 Exogenous: None
 Lag length: 6 (Spectral OLS AR based on AIC, maxlag=9)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-5.966323	0.0000
Test critical values: 1% level	-2.624057	
5% level	-1.949319	
10% level	-1.611711	

*MacKinnon (1996) one-sided p-values.

REER

Null Hypothesis: REER has a unit root

Exogenous: None

Lag length: 0 (Spectral OLS AR based on AIC, maxlag=7)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-2.636868	0.0097
Test critical values:		
1% level	-2.624057	
5% level	-1.949319	
10% level	-1.611711	

ARDL BOUND TEST

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	6.103444	10%	2.37	3.2
k	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

ECM

ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BM)	-0.257211	0.135971	-1.891656	0.0671
CoIntEq(-1)*	-0.929478	0.159153	-5.840161	0.0000

Appendix 3: Short-Run Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GDP(-1)	0.070522	0.171261	0.411782	0.6831
BM	-0.257211	0.161650	-1.591162	0.1208
BM(-1)	0.268586	0.154714	1.736017	0.0916
INF	-0.015282	0.025234	-0.605606	0.5488
REER	-0.004018	0.001249	-3.218426	0.0028
C	5.594171	2.139652	2.614523	0.0132

Appendix 4: Long-Run Result

Levels Equation				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
BM	0.012238	0.080777	0.151503	0.8805
INF	-0.016441	0.026746	-0.614717	0.5428
REER	-0.004323	0.001191	-3.630730	0.0009
C	6.018616	2.161908	2.783937	0.0087

Appendix 5: Error Correction Regression

Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.594171	2.139652	2.614523	0.0132
GDP(-1)*	-0.929478	0.171261	-5.427275	0.0000
BM(-1)	0.011375	0.075421	0.150819	0.8810
INF**	-0.015282	0.025234	-0.605606	0.5488
REER**	-0.004018	0.001249	-3.218426	0.0028
D(BM)	-0.257211	0.161650	-1.591162	0.1208

Appendix 6 Residual Diagnostic Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

Null hypothesis: Homoskedasticity

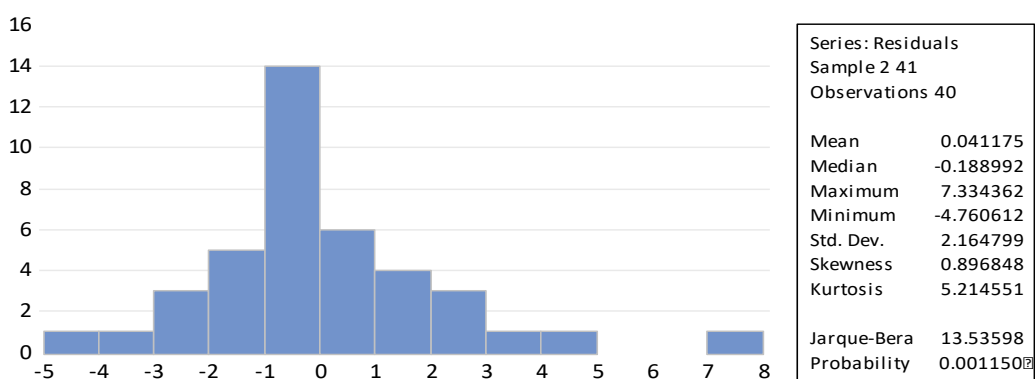
F-statistic	0.672462	Prob. F(5,34)	0.6471
Obs*R-squared	3.599683	Prob. Chi-Square(5)	0.6084
Scaled explained SS	5.963009	Prob. Chi-Square(5)	0.3098

Breusch-Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:

Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.197442	Prob. F(2,32)	0.8218
Obs*R-squared	0.487587	Prob. Chi-Square(2)	0.7836



Appendix 7: Pairwise Granger Causality Test

Pairwise Granger Causality Tests

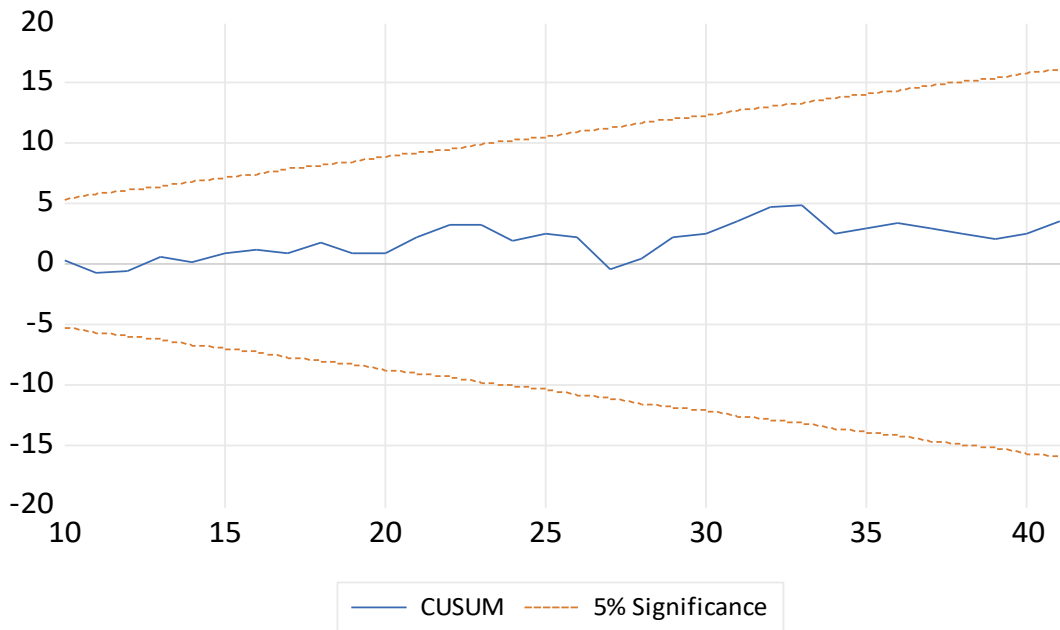
Date: 12/13/22 Time: 13:08

Sample: 1 31

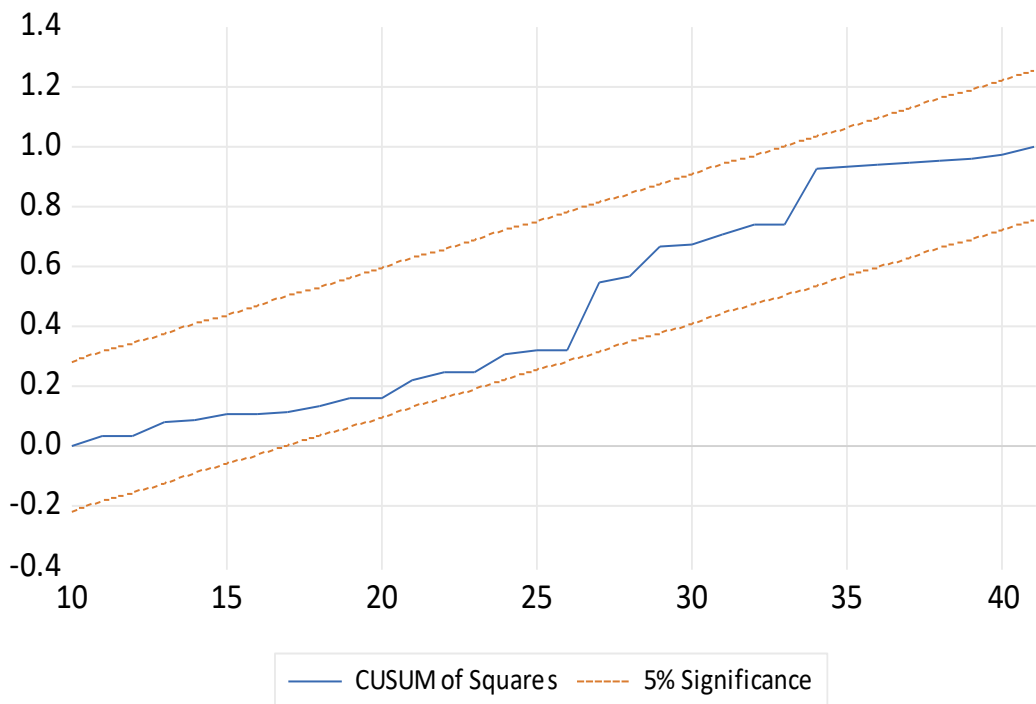
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
BM does not Granger Cause GDP	29	0.20433	0.8166
GDP does not Granger Cause BM		0.39856	0.6756
INF does not Granger Cause GDP	29	0.79619	0.4626
GDP does not Granger Cause INF		2.27921	0.1241
REER does not Granger Cause GDP	29	0.58872	0.5629
GDP does not Granger Cause REER		0.91948	0.4123
INF does not Granger Cause BM	29	5.40497	0.0115
BM does not Granger Cause INF		3.83237	0.0359
REER does not Granger Cause BM	29	4.13580	0.0286
BM does not Granger Cause REER		3.15607	0.0607
REER does not Granger Cause INF	29	3.58557	0.0434
INF does not Granger Cause REER		2.58109	0.0965

Appendix 8: Cusum Test Result



Appendix 9: Cusum of Square Test Result



Turnitine Report

Appendix 10: Turnitine Report

