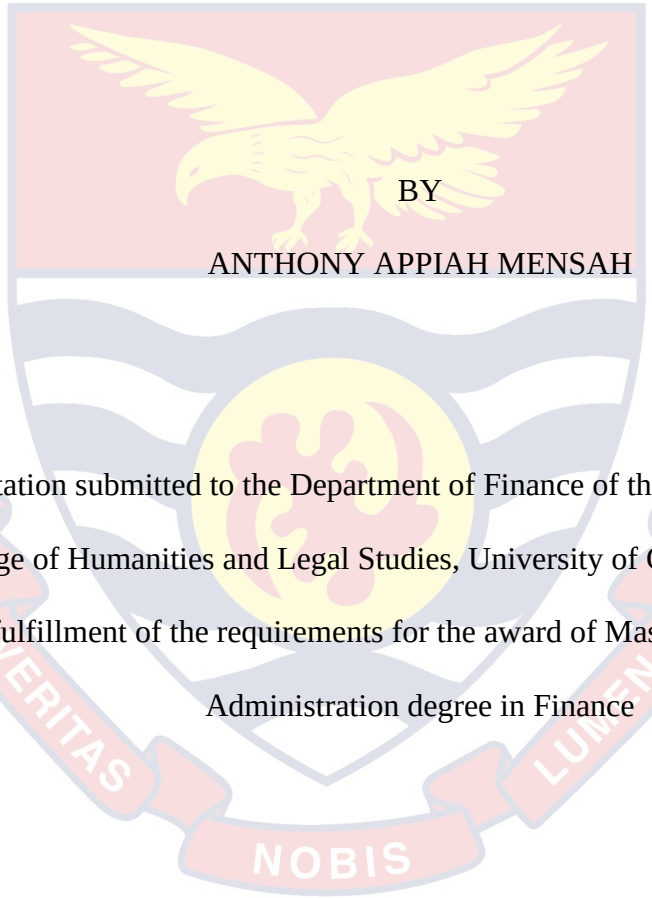
UNIVERSITY OF CAPE COAST

ECONOMIC STABILITY AND ECONOMIC GROWTH IN GHANA



BY

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DECLARATION

Candidate's Declaration

I hereby declare that this dissertation is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature……..... Date.....

Name: Anthony Appiah Mensah

Supervisors' Declaration

I hereby declare that the preparation and presentation of this dissertation were supervised in accordance with the guidelines on supervision of dissertation laid down by the University of Cape Coast.

Supervisor's Signature……..... Date.....

Name: Camara, K. Obeng (PhD)

ABSTRACT

The aim of the study was to examine the relationship existing between economic stability and economic growth (real GDP growth) in Ghana. The intuition was that though it has been acknowledged that economic stability and economic growth have bear some connection, but the direction of causality is inconclusive or ambiguous. The study employed the autoregressive distributed lag (ARDL) model to co-integration technique with a help of a secondary data ranges between 1980 and 2016, sourced from World Bank (World Development Indicators). It was revealed from the stationarity tests that all the variables were stationary of order 1. The diagram showed that the trends of inflation had been non-linear however, those of exchange rates and interest rates were partly linear. The study revealed that inflation, Interest and exchange rates affect economic growth both in the short run and the long run but, interest rates influence growth at 10 percent in the short run. The idea is that any instability in an economy negatively affects the growth patterns of the country. Apart from inflation and exchange rates, the study revealed that government expenditure, and trade openness, affect the economic growth of Ghana in the long run. Additionally, it was seen that direction of causality between inflation and growth was bi-directional while that of exchange rates and interest rates the direction of causality was only from stability to economic growth. The study therefore recommends that central bank do well to curtail rates of interest and inflation rates since increases in such variables reduce economic growth.

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DEDICATION

To my lovely parents Mr. Samuel Mensah and Esther Abaidoo

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CHAPTER ONE

INTRODUCTION

Economic stability is the prime objective of every economy and it is believed that sustaining stability leads to economic growth. The variations in economic stability variables trigger fluctuations in the economic growth of an economy. The aim of this study is to empirically test the aforementioned assertion that economic stability leads to economic growth with the help of the auto regressive distributed lag (ARDL). Generally, the measurement of economic stability variable has hovered around the use of one or indexes of variables such as rates of inflation, exchange rates, unemployment, fluctuations in stock prices, changes in interest rates, and changes in real GDP (Alonso & Garcia-Martos, 2012). However, this study operationalizes economic stability with the use of exchange rates, inflation rates and interest rates and the real GDP growth as economic growth.

Background of the study

The growth of every economy is dependent on certain factors key among them is the GDP growth, inflation, unemployment, exchange rates, and rates of interest of the economy. The intuition behind this claim is that the stability of the economy attracts investments from both local and foreign to the particular country. For example, countries with relatively unstable economic variables have slow or fluctuating growth (Agalega & Antwi, 2013). Globally, countries prefer to have stable economies with variables such as inflation rates, unemployment rates, exchange rates and the rates of interest all being at manageable levels. Continuous

changes or drifting in the above mentioned variables plunges the economy into economic instability. Conceptually, the transmission mechanism or the link between economic stability and economic growth is quite complex.

First, it is likely to rely on institutional settings to argue that economic stability will lead to growth (Agalega & Antwi 2013). It is not only whether policies are successful today that matters, but the perceived possibility that they will continue to change. To some scholars, the real gains in macroeconomic stability need to be seen by the private sector as indicators of a permanent shift in the macroeconomic policy system, in order for economic stability to have a major effect on development. Promoting stable results in the face of external shocks is another possible indirect connection between economic stability and development. This depends on how vulnerable to shocks the economy is. Macroeconomic fragility can have significant macroeconomic implications due to minor shocks. For fear of potentially harmful consequences, this may make the use of stabilization policies too expensive; here, policy paralysis is the outcome.

Fragility can mean that uncertainty becomes so bad that it cannot be countered by any feasible policy changes. These two points indicate that there is far more to the form of macroeconomic stability that is likely to be most conducive to economic growth than just a change in fiscal and monetary policies. For fiscal and monetary policy to influence economic growth, it must be grounded to the economic fundamentals (Benos, 2009). That is, both fiscal and monetary policies must go with exchange rate policy liberalization, lower rates of interest and relatively stable but lower rates of inflation. Stated differently, policy makers

ought to exploit various economic stabilization policies anchored onto both the fiscal and monetary policies without also losing sight of the institutional abilities.

The measurement of economic stability has been vague and quite general, however a more parsimonious and mostly used variables are the rates of inflation, exchange rates and rate of interest (Bhat & Laskar, 2016). That is to say that when such variables in an economy are not stable or fluctuate over time, then the economy would be referred to as being unstable. In addition, studies have shown that the use of inflation, interest and exchange rates to measure macroeconomic stability is successful since they are the results of demand and supply rather than the actions of individuals (Bhat & Laskar, 2016; Ezeji & Michael, 2013). The argument may be that other measures hinge on these variable, for example, 'all other thing being equal' in a stable economy with moderate rates of inflation and interest, job abounds since businesses can borrow money and expand the plant and that will call for increased in an employment.

Like many emerging economies, one of the fundamental goals of Ghana's macroeconomic policies is to achieve and maintain high economic growth (real GDP growth), along with low interest rates, exchange rates and inflation rates. According to Havi and Enu (2014), the fragile and torrid behaviour of the economic systems in the world over has questioned the way economies are managed. That is the fragility or instability in an economy has often manifested in the behaviour or changes in macroeconomic variables (real GDP, inflation, interest rate, unemployment, and exchange rate). To this extend, when there are increases in inflation and exchange rates, it discourages investments and

production locally, therefore reduces employments which its ripple effect reduces economic growth (GDP) as well. A classical case was the advent of financial crises between 2009 and 2011 that plunged most of the less developed and even developed economies. To this end almost all economies have been vigorously modifying their economic policies in order to wrestle the challenges that wreck economies going forward. Studies have shown that there are differences in both long-run and short-run relationships between economic stability and economic growth (Abd-Rahman, 2012; Kolawole 2013). Other studies that used rates of inflation, exchange rates and interest rates as a measure of economic stability also shared similar results (Bhat & Laskar, 2016; Brkic, 2001).

For example, Ghana reduced its monetary policy rate from 13.5 percent to 13 percent in 2011 through the Bank of Ghana's Monetary Policy Committee (MPC) and this was also reflected in the reduction of interest rates to around 15 percent and 17 percent to attract investment and develop the economy (Agyapong, Anokye & Asiamah, 2016). The other policy was also to adopt a very stern expenditure policy in order not to topple the rates of inflation. All these policies were geared towards having a better picture of the economy and providing stability to the economy. Moreover, these policies have stemmed from the fact that most authors and theorists have theorised that the proxy for economic stability in an economy have been low interest rates, exchange rates, rates of inflation and growth of GDP (Dinca & Dinca, 2013). Therefore, getting these variables to behave well, the better or the more stable will be the economy.

Many scholars identify a stable economy as an economy without major variations in key economic performance metrics, such as gross domestic product (GDP), unemployment, interest rates, exchange rates, and inflation (Ezeji & Michael, 2013; Havi & Enu, 2014). Stable economies, thus, display moderate GDP and job growth while keeping inflation, interest and exchange rates to a minimum. This statement supports the study by Frimpong and Oteng (2010) that GDP will always be affected by a high rate of inflation above 14 percent. The study went on to state that macroeconomic variables have been discovered as the determinants of a country's GDP, such as interest rate, inflation rate, exchange rate and money supply. The reason may stem from the fact that lower or moderate rates of these variables motivates business or spurs the rates of doing business in the country. Again, Aryeetey and Baah-Boateng (2007 as cited in Frimpong & Oteng, 2010) pointed out that, the economic growth (growth of GDP) Ghana enjoyed from 2004 to 2008 was because of relatively stable rates of inflation, exchange rates and interest rates.

According to Buaben (2016), volatility in exchange rates is a critical factor that needs to be taken into account in developing countries that rely heavily on foreign trade. This is because exchange rates are a central determinant of an economy's economic growth. It has historically been argued that the volatility of the exchange rate impedes the flow of foreign trade and that the volatility of the exchange rate reflects instability and may impose costs on risk-averse traders. Similarly, rates of interests and inflations have effect on the growth or otherwise of an economy. Generally, inflation negatively affects production and

consumption hence reduces revenue and increases the cost of production thereby reducing GDP or growth. High interest rates also slow lending and investments and increases savings. This negatively affects the growth in the real GDP of the country. Though economic growth is the sustained growth in the aggregate of the economy, however, little instability in the variables is able to throw the economic growth off gear. This therefore underscores the importance of behaviour of these macroeconomic variables to the growth patterns of the GDP of Ghana. These arguments above show that there exists a relation or link between economic growth and economic stability.

Dinca and Dinca (2013) noted that a stable climate for macroeconomic policy offers a fiscal posture that is firmly aligned with fiscal solvency. A monetary policy posture consistent with a low and steady inflation rate and a robust exchange rate regime that prevents both the structural misalignment of currencies and excessive real exchange rate volatility. Policies can impact growth in consequence, but they are a means to an end that only matters as a means of ensuring a more stable overall macroeconomic climate.

Statement of the problem

One of the most basic goals of macroeconomic policy in Ghana, like many developed and emerging economies, is to achieve sustainable economic growth. Many studies have attempted to create the relation between economic stability and economic growth, while others indicate a change from economic stability to economic growth (Havi & Enu, 2014). The focal point, however, is that inflation, exchange rates, interest rates (variables of economic stability) and economic

growth are related. This research is committed to empirically examining the path of how economic growth (GDP) is linked to inflation, currency and interest rates.

There are inconclusive results regarding the relationship between economic growth (GDP) and economic stability. While some believe that economic growth (real GDP growth) leads to low rates of inflation, interest rate and exchange rate others think otherwise (Boame, 2018; Bhat & Laskar, 2016; Havi & Enu, 2014). According to some studies and political commentaries, the economy is doing well and this may also be justified by the GDP growth figure of 4.6%. However, the economic fundamentals are wavering with inflation up from 9.6% to 11.3%. The interest rate proxied by prime rate is 17.5% and exchange rate up from 12.1% to 19.1% (Adenutsi, 2020). This narrative means that there could be increased in economic growth in the face of increases in inflation, exchange and interest rates. This assertion is not ideal but theoretical and may not represent realities on the ground.

The motivation for this study is to test the popular cliché that low exchange rates, low inflation and moderate interest rates of an economy drives economic growth. This is focused on the notion supported by other empirical studies that economic growth (low inflation, low interest rates, unemployment, and low exchange rates) can also be driven by economic stability (Ali, Irum & Ali, 2017; Bhat & Laskar, 2016). Therefore, this analysis is aimed at checking the relationship between inflation, interest rates, exchange rates, and economic growth. The use of VAR indicated that there appeared to be variations in the short-run and long-run, according to Abd-Rahman (2012); Kolawole (2013).

While Abd-Rahman (2012) found that economic stability was relevant in the short-run, Kolawole (2013) maintained that both long-run and short-run relationships were important. This research thus attempts, using current data and a different methodology, to test the relationship between economic growth and economic stability. Other research focuses on the determinants of economic growth without being related to the model's very variables (Baafi, 2017; Darko, 2015; Enu, 2009). By recognizing the connection between economic growth and economic stability and the path of causality, this study helps to bridge this gap.

Purpose of the study

The main objective is to determine how economic stability influences economic growth in Ghana.

Objectives of the Study

1. To conduct a trend analysis of economic stability and economic growth.
2. To determine the effect of economic stability on economic growth.
3. To determine the granger causality between economic stability and economic growth.

Hypotheses of the study

1. H_0: Economic stability rates do not affect economic growth.
2. H_0: Economic stability does not granger cause economic growth.

Significance of the study

The study is essential in the sense that Ghana's economic stability in the face of growth of its real GDP cannot be taken too lightly. This is because a country that boost of growth but has rather continuous instabilities in the

economic stability variables (currently low inflation), then it calls for an introspection into the happenings. Moreover, instability in the macroeconomic variables is enough to discourage other investors both local and foreign that would also spur the growth of the economy. Over the past years, the country has devoted a lot of resources both financial and human resources to attract investments into the country with the aim of job creation and economic growth hence the study is beneficial to both governments and policy makers to know the direction or how inflation, interest rates and exchange rates impact on the economy of Ghana.

Delimitation of the study

The analysis is delimited into two folds, contextual and geographical. The study focused contextually on the stability of the Ghanaian economy and how it affects the economy's development. Geographically, the research is about the economy of Ghana. Included variable; economic growth (GDP), inflation variable economic stability, interest rates, exchange rates, government spending on trade transparency, capital and labour. From 1980 to 2016, the analysis relied on annual time series results.

Definition of Terms

Economic stability: This study measured economic stability by using the changes or fluctuations in the rates of inflation, rates of interest, and exchange rates.

Economic Growth: Economic growth in this study was measured by the growth in the real GDP of the country.

Inflation rates: The changes in the rate of increases in the level of prices in an economy.

Interest rates: In this study, interest rates are measured by the lending rates used by banks. Usually the lending rates are arrived by pegging it to the discount or the prime rates by the central bank.

Exchange rates: Real exchange rate in this study was measured by the weighted average of a country's currency relative to an index or basket of other major currencies adjusted for the effects of inflation.

Fiscal policies: These are mechanisms of the central government that relates to government expenditure and taxes. It also relates to the means by which government adjusts spending and tax rates to monitor and influence the economy.

Monetary policies: These policies are also strategic measures that governments employ through the central bank to control rates of interest and money supply.

Capital expenditures: These involves all the money a country spends on buy, maintain fixed assets.

Recurrent expenditures: These involve all other payments or expenditure except ones on capital assets.

Organisations of the study

This research is structured into five chapters. Background to the study, problem statement, study purpose, hypotheses, significance, and delimitations of the study as well as the organization of the study are given in chapter one. The

theoretical and empirical literature underpinning as well as the history of Ghana's economy were presented in the chapter two. The analytical structure and methods used in performing the analysis are discussed in Chapter Three. Chapter Four discusses the findings of the study. The final chapter provides the study's summary, findings and recommendations.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter presents the review of related literature on economic growth (GDP), economic stability and how they are related. The chapter comprised the theoretical framework and empirical or conceptual framework underpinning the study. Other areas such as trends, overview of macroeconomic developments, and various indicators of macroeconomic stability were also assessed.

Theoretical framework of the study

Many hypotheses and other empirical studies have attempted to define the variables that boost a country's economic development and efficiency. This is in order to provide policymakers with suggestions for filling the gap between developed and developing countries and for creating sustainable development. Most growth studies have used the Keynesian growth model or the Neoclassical growth theory to underpin the arguments. This study however reviews both theories but the Neoclassical growth theory was used as the basis for this study.

Keynesian theory of growth

According to Okpanachi and Abimiku (2007), Keynesian economics indicates that an increase in government spending increases domestic production. That is, in the short run, deficit spending or government spending boosts the economy by making households feel wealthier, thus increasing overall spending on private and public consumption (Joshi, 2011). In an underemployed economy, government purchases contribute to aggregate demand at prevailing prices and

interest rates with no arithmetical need for private households to balance (displace or crowd-out) their own purchases as long as private goods are not closely replaced by public goods. In stark contrast to Say's Law, the resulting faster growth of nominal GDP would automatically generate faster growth of real GDP and demand would thus create its own supply (Reynolds, 2001).

The Keynesians school of thought and macroeconomic growth are linked through government expenditure. This is such that as government increases its expenditures or spending, it results in crowding-out private (investment) spending through increased cost of credit (interest rate). The Keynesians further posit that that link may either have a positive or negative effect on the economic growth of a particular state. In the view of Brkic (2001) when government spends or increases its expenditure, it increases money in circulation and that further lead to demand pull inflation. The increase in expenditure may also give rise to two possible outcomes; first the increase in expenditure of government will increase money supply and inflation and as well cripple private investments. Second, with the increase in money supply, demand pull inflation will occur and central bank will respond by targeting inflation using interest rates, thus raising interest rates. In effect, GDP would rise initially which will lead to the rise in government expenditure, but further rise in inflation and interest rates will cripple growth thus making the growth unsustainable.

Many traditional Keynesians argue that rise in government expenditure need not crowd out private investments. Eisner (1988, cited in Neaime, 2008) argued that increased aggregate demand increases the profitability of private

investment and, at any given rate of interest, contributes to a higher level of investment. Thus, despite the fact that they increase interest rates, expenditures can actually stimulate aggregate saving and investment. In Eisner's opinion, higher utilization is given by otherwise unused capital. Three fundamental objections to the Keynesian theory of budget deficits were emphasized by Eisner (1988) and are as follows; first, while Keynesians are to be praised for recognizing the value of unemployed resources, they still have not arrived at a completely satisfactory theory after more than five decades that accounts for the existence of unemployment. It actually raises the issue of moving the explanation to old-fashioned wage-price stickiness. The poor comprehension by Keynesians of the unemployment phenomenon is very worrying. If a market failure occurs, evaluating the consequences of government policy under the premise that the manifestations of the failure will stay fixed is potentially quite misleading.

Second, the Keynesian forecast for spending suggests that the government can and will 'fine-tune' fiscal policy. If we assume that investment raises aggregate demand, then it follows that this stimulus may be detrimental to conditions. Also the most steadfast Keynesian is able to admit that the rise in government spending crowds out private investment and increases inflation rates with full employment. Many Keynesians (such as Eisner) are proposing a 'nominal' deficit policy, realizing the real costs of crowding out, which would prevent real deficits from rising before the economy hits full employment. In addition, the third issue relating to the Keynesian model is that it primarily describes the effects of transient deficits. This is a rise in expenditure and a

corresponding increase in inflation, and interest rates contribute to deficits without a commensurate increase in revenues, which can plunge economic growth.

The Neoclassical theory

Government spending funded by domestic debt is merely a redistribution of capital from the private sector to the public sector, with little or no impact on production, for neoclassicists or monetarists. However, because the private sector is more effective than the government, in the opinion of monetarists, such a transition may have a negative impact on production. On the contrary, the monetarists argued, however, that increased government spending funded by monetary expansion has a significant stimulatory impact on the economy and, as such, increases aggregate demand (Mitchell, cited in Benos, 2009 in 1974). A rise in government spending funded by bonds increases interest rates, which leads to private investment being squeezed out. Increased bond supply has a negative effect on investment, as interest rate growth leads to a large decrease in investment demand (Ali et al., 2017).

In the external sector, government deficits to monetarists cause an increase in demand for imported foreign goods and assets, resulting in an unfavourable balance of trade. This is attributed to the supply of surplus money brought on by the central bank's debt instruments (Okpanachi & Abimiku, 2007). However, there are three key features of the standard neoclassical model: first, the consumption of each entity is calculated as the solution to an interim optimization problem, where both borrowing and lending are allowed at market interest rates.

Second, individuals have finite lifespans. For each client, a single cohort or generation belongs, and the lifespans of subsequent generations overlap. Third, market clearing is commonly assumed in all periods.

To summarize, both theories recognize that there is relationship or link between economic growth and macroeconomic stability. However, the approach differs, while the former believes that the link begins with government expenditure to inflation and interest rates, the latter who the monetarist is argued that money supply by government triggers changes in inflation and interest rates and further leads to changes in the exchange rates.

Trends of Macroeconomic Stability Variables

The aim of every economy or country is to create an enabling competitive business environment for domestic and foreign investors to operate in order to fuel its growth. This invariably means lower exchange rates, moderate rates of inflation and low levels of interest rates that would attracts investments and therefore spur the growth of the economy. The situation for Ghana has not been far from this.

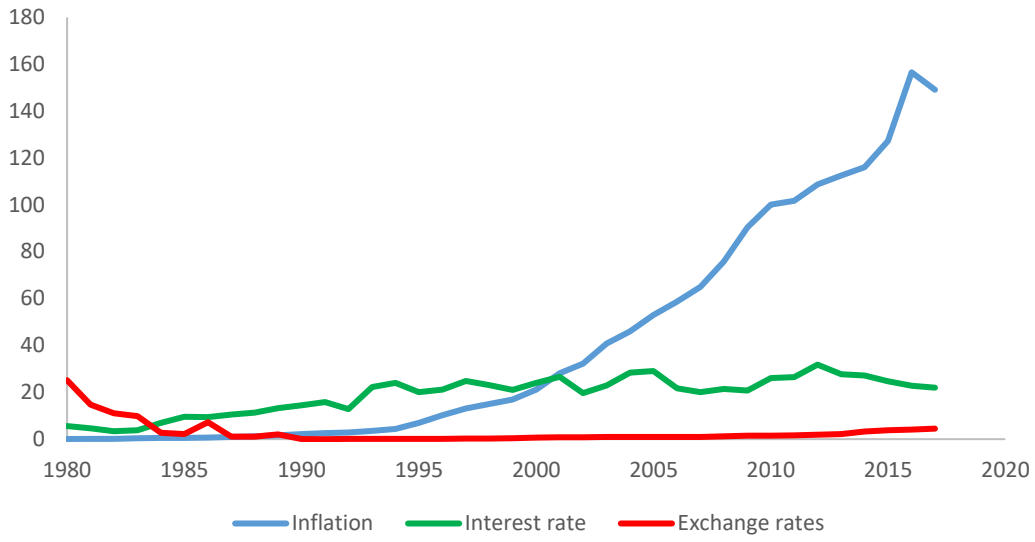

Figure 1: Trends in Inflation, Interest and Exchange Rates in Ghana

Source: Mensah (2019)

Figure 1 shows the trends (graphically) of some dominant macroeconomic variables in the economy of Ghana. The diagram shows the behaviour of these variables from 1980 to the 2016. First, with inflation, the year on year inflation has been increasing gradually from 1980 to 1995 where the ascent became steep. Studies have suggested that the sudden rise in the rates of inflation came about as a result of the expiration of the economic recovery program. It made government spend on both capital and recurrent expenditure. For instance, in the study of Boakye–Gyasi and Li (2017), it was stated that the advent of the ERPs saw Ghana moved from controlled exchange rates to flexible exchange rates and gradual rise in the inflow of FDIs.

In fact, it was such period that the inflation in the economy also started rising. This behaviour of steady fluctuation continued till the 1990s. There was also a rise in inflation with moderately lower exchange rates in 1994. This

behaviour could be explained by the privatization of Ashanti Goldfields Company AGC such that the sale injected lots of cash into the economy. The injection invariably increased money supply and as the theory on inflation has it, the higher the supply of money in circulation the higher the rates of prices (inflation) (Aheto, 2014). The subsequent years after 1994 saw further increase in inflation and exchange rates just that the rise in the exchange rates were relatively moderate.

Interest rates have also been rising moderately over the same period. In 1993 the rates of interest proxy by the prime rate decreased and this was explained by the drive of government to motivate businesses to commit into having faith in the economy. However, subsequent years saw increases in the interest rates. Form Figure 1, it could be observed that interest rates between 1997 and 2002 were rather undulating before it rose again in 2003. It is worth noting that between the same periods of undulating interest rates, the rates of inflation were also rising sharply until the year 2012 where it fell shortly but increased to 2016, however after 2016, the trend showed a downward behaviour. Within the same regime, Exchange rates have also behaved well i.e. moderately low until after 2007 where it started to increase and gradually increased to its current position of about 11.7%.

According to Boakye–Gyasi and Li (2017) from the early 2000s up to 2008 where FDI rose to all time high saw inflation also to be on the high side only for exchange rates to be down. After 2010, every increase in money supply either through seignorage or other means has witnessed higher rates of inflation and exchange rates. However, interest rates after 2013 have remained moderately low.

Therefore, there is enough justification to assume that the expenditure levels or levels of money supply certainly have a toll on the movement or behaviour of inflation and exchange rates.

Factors of Macroeconomic Stability

Macroeconomic stability is measured by five variables according to the Maastricht criteria: inflation, interest rate, debt, deficit, and currency stability (exchange rates) (Kolawole, 2013). Low and stable inflation essentially implies healthy market demand, while high or unsustainable inflation threatens productivity. Also, low long-term interest rates represent stable future inflation expectations. For example, where current inflation rates may be relatively low, according to Kolawole (2013), high long-term rates indicate higher inflation to come. It means that the economy is stable and is likely to remain so if these rates are kept low. Moreover, the low national debt compared to GDP suggests that the government would have the freedom to use its tax revenue instead of paying international creditors to meet domestic needs.

Moreover, in times of recession, a low national debt permits lenient fiscal policy (Benos, 2009). Maintaining low deficits would curb national debt growth. The stability of currencies or stable exchange rates enables importers and exporters to build long-term growth strategies, thus reducing the need for investors to manage exchange-rate risk. In the case of national accounting, currency stability decreases the danger posed by foreign currency debt emissions. Kolawole (2013) once again emphasized that the Maastricht criteria, however, capped inflation at 3 percent, interest rate at 7 percent, debt at 45 percent of GDP,

deficit at 3 percent of GDP, and permitted fluctuation of currency at 2.5 percent for growing economies at most.

Inflation

Frimpong and Fosu (2011) have clarified that there has been a growing trend towards inflation over the past 40 years. They said it reached a peak during the political tumultuous periods in the 1970s and early 1980s and continued in the era of the economic recovery program after 1983. It is said that inflation has both direct and indirect effects on each sector of the economy (Asalou & Ogunmuyira, 2011). It differs from, among other factors, exchange rate, interest rates, unemployment. Bakaert and Engstrom (2010) recorded that during inflationary times, investors become risk averse and that economic instability contributes to high risk aversion on the part of investors during periods of recession. The higher risk aversion associated with a growing trend in inflation from an equity valuation point of view would lead to high equity risk premiums and low equity prices.

In view of the risk aversion factor on the part of investors, investors will reduce their equity mutual fund contributions before the valuation starts to rise to the level where it is proportional to the level of risk. Asalou and Ogunmuyira (2011) maintained that it is very important to assess its effect on economic growth because of the unpredictable state of inflation on economic growth. Inflation was further identified by Asalou and Ogunmuyira (2011) as the rates at which prices of goods and services in an economy are growing. However, since inflation can be ambiguous or more general, researchers use a benchmark, i.e. referencing it to

a deflator or a base year, so that the prices of products and services are believed to have risen if it rises above the base year.

Exchange Rate

Olweny and Omondi (2011) describe the exchange rate as the price of the currency of a country relative to the currency of another country. Again, currency risk is also the responsiveness of exchange rate risk to economic response, according to Adler and Dumas (1984). The sensitivity of the exchange rate plays a role in the yield rate of foreign investors who tend to invest in the domestic market and of domestic investors who tend to invest in the foreign market. Example if mutual funds are Pan African, meaning they are invested outside Ghana. If the fund is a Pan-African one, it is invested in other countries other than Ghana and therefore during the daily valuation process, the investment kept outside Ghana by the funds is translated back to the Ghanaian Cedi from the local currencies of those countries. To accomplish this, from their local currencies, we convert the value of those instruments to a common currency that is globally accepted and easy to convert to Ghana Cedis. The US Dollar (US$) is the local currency we use here. If the Cedi appreciates in such a situation as against the US dollar the share price is likely to decline.

The modern portfolio theory states that systemic risk cannot be diversified in any situation and, as a result of this risk, businesses should always find a way to pay shareholders a premium. Diversification can help take away exchange rate risk in productive markets. For example, Ali, Rehman, Yilmaz, Khan, and Afzal (2010) postulated that the risk pricing between the foreign exchange and stock

markets is consistently highlighted by an effective foreign exchange mechanism and stock market arbitrage powers.

Interest Rate

In the pricing of securities and the allocation of resources by companies and investors, interest rates play a crucial role. As a result of the diverse existence of investments, things are getting complex when it comes to mutual funds. However, the effect of changing interest rates is reasonably straightforward when it comes to debt-oriented funds (Boyte-White, 2015). Studies have shown that the time-varying interest rate dimensions and the vulnerability to the inverse impact of interest rates have on stock prices, e.g. (Titman & Warga, 1989). Investment decisions are often influenced by an increase in interest rates, so investors shift the structure of their investment portfolios, typically from equities to fixed income securities (Syed & Anwar, 2012). The value of a mutual fund investment is measured by its net asset value, which is the overall market value of the entire portfolio divided by the number of shares outstanding, plus any interest or dividends received.

As the NAV is focused in part on the market value of the assets of the fund, rising interest rates may have a serious effect on the NAV of the unwanted assets owned by the bond fund. The NAV can jump dramatically if interest rates drop and older bonds start trading at a premium (Boyte-White, 2015). Interest rate increases can be either devastating or nice for individuals, provided the short-term discount of mutual fund shares (Boyte-White, 2015).

Relationships between Economic Stability and Economic Growth

The extant literature reveals the existence of several paradigms on the nature and relationship between inflation and economic growth. The Keynesian school maintains that inflation spurs economic growth through two main channels. First, inflation propels economic growth through redistributing income from workers with low marginal propensities to save to entrepreneurs who are believed to have the financial muscles to save and invest. The second channel is through boosting nominal rate of return on investment relative to the rate of interest that propels investment.

The traditional Keynesian model consists of the functions of aggregate demand (AD) and aggregate supply (AS) that adequately explain the correlation between inflation and economic growth. The main feature of the Keynesian model is that the role of aggregate supply in the short-run is upward sloping and not vertical. This means that changes in the demand side of the economy only affect prices when the role of aggregate supply is vertical, while changes in aggregate demand affect both prices and production when the role slopes upwards. This is true since the inflation rate and the level of production in the short term are influenced by several factors. These include shifts in perceptions, labour force, prices of other production, economic, and monetary policy factors, among others (Gokal & Hanif, 2004).

The Keynesian theory thus posited that due to the 'time-inconsistency dilemma' there is a positive relationship between inflation and economic growth. The issue of time inconsistency occurs when producers believe that the prices of

their competitors' goods do not adjust overtime, but only the prices of their goods, which would increase while other producers operate at the same price level. The Keynesians therefore supported the existence of a positive relationship between economic growth and inflation. Blanchard and Kiyotaki (1987) argued that the positive relationship may be attributed to an arrangement between certain companies to supply their goods at an agreed price at a later date. Consequently, even though the price of goods rises in the economy, production will not decrease as suppliers have to meet the demands of the customers with whom the agreement has been reached.

In contrast, the monetarists contended that during the periods of high inflation episodes, the behaviour of all sectors of the economy become adjusted to the inflationary expectation. Thus the effects of inflation will be to redistribute income from workers and savers who are holders of money balances and are deemed to be the only losers from anticipated inflation, to the capitalists who are believed to have the financial muscles. In essence, the monetarists argued that inflation imposes an inflation tax on holding of money. Thus, this will serve as an incentive to tax evaders to decrease their real money balances, reduce payment period and hold inventories rather than cash hence wastage of resources and reduction of real income thereby decelerating economic growth (Friedman, 1971). Inflation was the result of a rise in the supply or velocity of money in circulation at a rate greater than the rate of economic growth, he argued.

The classicalists, as revealed in the Mundell (1963) and Tobin (1965) framework, hence the so-called Mundell-Tobin effect argued that inflation impedes economic growth by raising the cost of holding money balances and thus leads to portfolio substitution of money balances in favour of capital. It was obvious in this argument that current and expected inflation discourage borrowers and reward lenders such that it becomes rational for savers to convert their savings to financial savings to gain the expected return now and in the future. This profitable opportunity has shown that high inflation lowers the real interest rate, resulting in high investment and thereby boosting economic growth. The classicalist stance, however, has been questioned in literature. It has been suggested that inflation serves as an investment tax and therefore raises investment costs, which is contrary to the Classicalist proposal (Stockman, 1981; Fischer, 1993). Fischer (1993) argued that current and expected high inflation increases uncertainty about macroeconomic environment which distorts savings and investment decisions thus reducing economic growth.

A positive relation between inflation and economic growth was also maintained by the neoclassicalists. Tobin (1965) argued that by either retaining money or accumulating resources, individuals substitute current consumption for future consumption. Under this strategy, despite capital yielding a greater rate of return, individuals maintain precautionary balances. He further argued that people move away from money with its lower return and transfer to capital through the portfolio process. The consequence is that the amount of production is continuously increased by a high inflation rate. Nevertheless, during the transition

from old capital stock to new capital stock, an ad hoc impact on production growth occurs. Under this condition, the influence of inflation can be referred to as a 'tortoise effect' by stimulating enormous accumulation of capital and higher economic growth only before capital yields decrease. Simply put, the Tobin effect argues that inflation encourages individuals to transfer money to interest earning assets, leading to tremendous capital intensity and improving economic growth. Inflation, in particular, shows a positive relationship with economic development. Tobin (1972) also took the view that, owing to the downward rigidity of wages and prices, the change of relative prices during times of economic development could be accomplished by the upward price movement of such individual prices.

Empirical literature review

Economic Growth and Inflation

The empirical literature contains extensive studies on the relationship between inflation and economic growth. Despite the differences in the studies, there is no convergence on the empirical results as Samuelson & Nordhaus (1995) stressed that although economists may disagree with the exact inflation target, most agree that the best environment for healthy economic growth is a predictable and stable or gently growing price level. Andres and Hernando (1997), who discovered a substantial negative impact of inflation on economic growth, also confirmed this. The relationship between inflation and economic growth in Fiji for the period 1970-2003 is also examined in Gokal and Hanif (2004). A poor negative correlation between inflation and growth was discovered in the analysis,

while the causality between the two variables ran from GDP growth to inflation in one direction. Nevertheless, Sala-I-Martin's (1997) research indicated that inflation was not a robust economic growth determinant.

In addition, Khan and Senhadji (2001) described a 10.5 percent inflation threshold as statistically important to clarify the inflation-growth nexus in Nigeria, as Sarel (1996) offers a threshold point estimate of 9.9 percent. In other studies, a two-threshold point model with 11.2 and 12.0 percent as the appropriate inflation threshold points for Nigeria was suggested by Drukker, Gomis-Porqueras and Hernandez-Verme (2005). However, Doguwa (2012) reexamines the question of the presence and the degree of the inflation threshold in the inflation-growth relationship, using three separate methods that include adequate procedures for estimating the level and inference of the threshold. The results indicated that for Nigeria, the threshold level of inflation above which inflation is averse to growth is projected at 10.5 to 12 percent.

In addition, Kim and Willet (2000) demonstrate that inaccurate estimates of inflation levels are created by mixing up both developed and developing economies. Khan and Senhadji (2001) take this point and, for both developed and emerging economies, perform two sub-sample studies. The research uses the nonlinear least square (NLLS) where the threshold inflation level is given by the minimum value of a residual sum of squares for a probability ratio test. The findings indicate that for both the developed and emerging economies, there were two separate inflation thresholds of 1 and 11 percent. Below these tipping points, inflation's effects on growth are positive in both cases, and inflation reduces long-

term growth above these stages. A similar distinction is made between developed and developing countries by Burdekin et al (2004) and their respective thresholds are established. The authors note that inflation has steadily negative but (statistically) negligible effects of up to 8 percent in developed economies. For developed economies, on the other hand, the effects of up to 3% are positive and important.

Chen and Qin (2016) in the study on economic growth and macroeconomic conditions using data spanning from 1991 to 2014 and employing the cointegration approach revealed that, a rise in economic growth pulls along rates of inflation and exchange rates. Unlike other studies that posit that it is the macroeconomic stability i.e. inflation that drives economic growth, Chen and Qin (2016) mentioned that it is rather growth that pulls inflation along. The study again mentioned that the rises in inflation inversely affect the GDP growth of a particular state no matter how or what the threshold is.

The study of Frimpong and Oteng (2010) using vector auto regressive technique indicated that rate of inflation is an important determinant of economic growth in Ghana. Thus very low inflation discourages production and that reduces the real GDP growth drastically. However, a very high inflation over 11 percent would reduce consumptions and revenue levels. This further stifles the knack for doing business and that is a recipe for slower economic growth. Agalega and Antwi (2013) also added that inflation in itself may not be problematic to economic growth since sustained growth overtime can cancel the instability thereof. However, the study mentioned that fluctuations in macroeconomic

variables such as unemployment, rates of exchange and stock prices are likely to compound economic instability and further scrap the real GDP growth.

Furthermore, Havi and Enu (2014) reiterated that high levels of inflation are inimical for every economy. The arguments stem from the fact that inflation may charge against consumption. Again, high inflation rates only delays consumption and moreover, when consumptions are delayed over long period of time it affects the production. It has also been emphasized that even though inflations are preferred by producers or suppliers, very high levels of inflation affect the psyche of producers. Therefore, the sale of their produce would be in doubt especially where there is transportation cost and exchange rate challenges.

Additionally, Agyapong et al (2016) rehashed the importance of inflation to economic growth. The study pointed out that inflation at some level may be inertia to growth of an economy. Inflation eat-away the profits of producers because producers also depend on other raw materials for production. Therefore, if prices continue to increase, it would increase the cost of production and further increase the price of the commodity and thus cut sales to absolutely low levels. The study was also quick to add that rather than real GDP growth (economic growth) driving fluctuation in inflation, it is stable rates of inflation that influence economic growth.

Economic Growth and Real Interest Rate

In their conclusions, the studies on growth and true interest rate nexus are few but reliable. These studies include D'Adda & Scorcu (1997), which explores the relationship between growth and actual interest rates for the period 1965-

1994, considering 20 developed countries. A strong negative association between growth and the real rate of interest was recorded in the analysis. During the period from 1963 to 1999, Ismihan (2003) investigated the effect of macroeconomic uncertainty on various types of investment in Turkey. The study found that, in the case of Turkey, macroeconomic uncertainty had a negative effect on economic growth and capital accumulation. The study concluded again that the relationship between private investment and public investment is impaired by long-term macroeconomic uncertainty.

Using quadratic interaction, Klein (2003) also explored the connection between per capita income and financial growth. It was discovered that, in the case of middle-income countries, there was a positive and important relationship between financial progress, trade openness, interest rates and economic growth, but vice versa in the case of poor and rich countries. Capital absorption capacity is low in developing countries, so financial development has a negative impact on economic growth.

The determinants of macroeconomic stability were also studied by Subramanian and Satyanath (2004). They concluded that there is a positive and important relationship between democracy and economic development and macroeconomic stability, that is, interest rates and inflation rates. In addition, Anaripour (2011) uses panel data for the period 2004-2010 from 22 countries to test the relationship between interest rates and economic development. The findings show that there is a negative relationship between interest rates and economic growth, and that relationship is a one-sided causal correlation between

interest rates and economic growth. The study concluded that an interest rate fluctuation (increase or decrease) has little effect on economic development.

Herrera and Aykut (2014) in their study mentioned that apart from exchange rates, and changes in rates of inflation that causes instability in most economies, changes in interest rate also affect the rates of doing business in Ghana. The study in fact stated that it affect rates of investments and savings. High rates of interest will crowd out local investments, that is government or external investors would override that of local investments. Also higher investment rates will make people to save rather than to invest or do something with their money. However, savings without production profit little to economic growth.

In the study of Darko (2015) interest rates, inflation rates, real growth rates and exchange rates are all determinant of economic growth and are also economic stability variables. The difference is that of the technique of analysis, while Darko (2015) used the vector autoregression model (VAR), Herrera and Aykut (2014) used the multiple deterministic regression model. Again, the study of Darko (2015) mentioned that economic growth drives a stable economy.

For Baafi (2017), Ghana's economic growth is dependent on certain key variables like inflation, interest rates, exchange rates, and stable prices on the stocks. These economic indicators or stability variables ensure that there is a sustained economic growth. In other words, there could be growth in an economy but without stable economic variables, the growth would wash away or cannot be sustained. This study was directly in line with the assertion of Enu (2009) on the

Ghanaian economy that inflation, exchange rates, low unemployment and interest rates sparks economic growth. The study even likened the state of the Ghanaian economy to the other producing economies like Turkey, Mexico and Brazil and reiterated that if inflation and exchange rates are not curtailed, economic growth will elude us.

Economic Growth and Real Exchange Rate

Economists have long recognized that exchange rates that are poorly controlled can be catastrophic for economic development. In this context, for a group of 27 nations, Kamin and Klau (1998) used an error correction technique to analyze the relationship between real production and actual exchange rate. The analysis shows that in the long term, devaluations have not been contractionary. The result also indicates that reverse causality, although the effect continued even after the implementation of controls, tended to alternate the calculated contractionary effects of devaluation over the short term. In order to find a potential relationship between real GDP and selected macroeconomic variables that include the real exchange rate for Venezuela, Hsing (2005) employs the IS-LM model.

The study shows that depreciation of the real exchange rate increases real GDP growth in the nation using annual time series data from 1959-2001. Meanwhile, Ito, Isard & Symansky (1999) discussed the connection between the real exchange rate and economic growth in Asian countries using the Balassa-Samuelson hypothesis in an earlier report. Findings from the study indicate that as the economy rises, non-tradable prices will not rise compared to tradable prices.

In this way, tradable prices, calculated in U.S. dollars, may deviate from U.S. tradable prices, and economic reforms may contribute to a negative connection between growth and actual appreciation. Furthermore, using annual data from 1978-2000, Thapa (2002) analyzed the econometric relationship between the real exchange rate and economic activities (measured by GDP) in Nepal. The approximate ECM regression equation shows that there is a contractionary impact of the real exchange rate on economic activity.

For a set of 82 advanced and emerging economies, Vieira et al. (2013) evaluated the role of real exchange rate volatility in long-term economic development, using a panel data set ranging from 1970 to 2009. Their findings for the two-step Generalized Moment Method Models (GMM) panel growth models show that a more (less) volatile RER has a substantial negative (positive) effect on economic growth with an accurate exchange rate volatility test. For various model requirements, their findings were also robust. It must be stressed that the effects of the effect on economic growth of exchange rate fluctuations are empirically mixed and inconclusive. As shown by some country-specific studies, the essence of the effect is positive (Mahmood, Ehsunullah & Ahmed, 2011 in Pakistan; Danmola, 2013 in Nigeria), while others suggest a negative direction (Sanginabadi & Heidari 2012 in Iran; Pokhariyal et al., 2012 in Kenya) and yet others still find that there is no relationship (Ghosh et al., 1997) that makes the problem more empirical. This work therefore seeks to find out about the situation in Ghana.

Baafi's (2017) research emphasized that exchange rates are critical for economies dependent on trade. Earlier in their report, Frimpong and Fosu (2011) reported that exchange rates are important determinants of economic growth. The opinion is that the exchange rates are determined by the demand and supply of the goods exchanged or the imports and exports of the goods traded and are far away from the labour of some individuals. Therefore, it will force or drive the economic growth of the economy if these fundamentals are strong.

Alagidede, Baah-Boateng and Nketiah-Amponsah, (2013) also said that stable variables were important to the growth rate of Ghana's economy. It is worth noting that the study of Alagidede et al (2013) only examined or investigated the overview of Ghana's economy. For instance, the study was explicit that the negative growth that occurred in Ghana in the year 1967, 1972, 1975-1976, 1979, and 1980-1981 were all triggered by volatilities in exchange rates, inflation and political instabilities. In addition, the study indicates that the downturn in economic growth in the late 1970s and early 1980s may be blamed on misplaced economic policy in the form of inflationary (inflation) financing and domestic (high interest rate) borrowing. The decline in growth between 1983 and 1990 was also due to the exchange rate regimes employed and the dependency on foreign policy.

Boame (2018) in his study of "primary-export-led growth in Ghana" stressed that exchange rates are justifiable variable Ghana should look at, as a growing the economy. This claim is in line with the assertion of Bawumia that "if you play propaganda with the economy the exchange rates will expose you". This

was an attribution to the fact that the fundamentals of the economy are very much important to its economic growth achievements. Adenutsi (2020) stated that import or export dependent economies like emerging economies should be interested in the changes of exchange rates. Since the economy thrive on imports or exports, any fluctuations in the exchanges rates could affect the behaviour or growth dynamic in the country.

Chapter Summary

This chapter reviewed the relevant or related literature on the subject matter. Growth theories such as the Keynesian and Neoclassical theories were all reviewed and the study saw that though both economic stability variables influence economic growth, their pass through effects are different. The study also examined the trends of stability variables like inflation, interest rates, and exchange rates. In general, relative to inflation and interest rates that have stayed strong in the past decade, exchange rates have been stable. Macroeconomic stability factors in Ghana were also explored in the report. There are several trends or macroeconomic factors that have been achieved that can affect an economy 's stability or otherwise. However, the influence of inflation, exchange rates and interest rates has been stressed because they pose the most vicious and simplest challenge to the country’s economic development. Finally, the effect of economic growth (GDP) on each of these variables in Ghana has been examined in the literature. There were no large variations in the conclusions of the studies thus in simple terms mentioned that economic stability was the panacea to

economic growth. The only difference the study saw was down to data variations and statistical technique differences.

CHAPTER THREE

RESEARCH METHODS

Introduction

The chapter present the methods employed for the analysis of the study. It begins with the design of the study. The design as it offers guide that directs the research action. The theoretical and empirical models specification followed then the data source and description. The theoretical and empirical models give the framework for analysing the study. The next section was the justification of variables, the data analysis and the estimation techniques.

Research design

The study made use of quantitative research and a causal design. The quantitative method is structured and formal, and the distance to the source of information is often greater than in the qualitative method (Levy, 2004). The study employed quantitative method because it is most suitable for the research issue and the way information was gathered and analysed. Again, the design of quantitative analysis ensures that the researcher's biases are reduced and thus ensures that generalizations can be made in relation to the study's findings.

The design of the study took the form of a time series. A time series requires the repeated collection of data from the same unit(s), enabling both the aggregate level and the individual level to track changes (Asteriou & Hall, 2011). In order to evaluate the temporal order of events, causal analysis was used and this was appropriate since the central concept of causal reasoning is that a cause must precede its consequence in time. It can be difficult to determine the order in

which events occur in cross-sectional research where all data is collected at one point in time, but time variant analysis (time series or panel) designs allow tracking of the order in which events occur. Since the study seeks to test hypothesis of units which keeps changing with time, it become obvious that the choice of time series study was appropriate.

The study also employs the Autoregressive Distributed Lag (ARDL) approach in handling this study. This is also enshrined to the fact that most of the studies in this area have tended to use the Ordinary Least Squares (OLS) and Vector Autoregressive (VAR) approaches. Rather relying on the strength of the ARDL approach in handling few data points. The VAR method has been greatly criticized to lack dynamism and lack robustness for few data points (Pesarn, Shin & Smith, 2001). Therefore, the study determines how economic stability (inflation, interest rates and exchange rates) influences economic growth in Ghana. The study again determines the level of causation between economic growth and economic stability.

Theoretical model selection

The usual neoclassical model of Solow explains production as resulting from the combination of two elements, namely capital (K) and labour (L).

$$Y = f(K, L) \tag{1}$$

Solow assumes from equation (1) that this production function shows constant returns to scale (CRS), meaning that if all inputs are increased by a certain amount, the output will increase by exactly the same number. Thus, the following

condition must hold for every positive constant φ the following condition must hold:

$$\varphi Y = f(\varphi K, \varphi L) \tag{2}$$

Assuming that φ is $1/L$ gives equation (3) below;

$$\frac{Y}{L} = f(\frac{K}{L}, \frac{L}{L}) \tag{3}$$

This implies equation (3) will also be

$$\frac{Y}{L} = f(\frac{K}{L}, 1) \tag{4}$$

In addition, Solow also assumed positive but decreasing marginal returns for all single inputs, assuming constant returns to scale (Liu, 2007). That is, the output slope decreases continuously because smaller and smaller output is caused by each additional increase in K relative to L (Van den Berg, 2001). The Solow model's inherent features that bring convergence to light are these. The model thus assumes that a constant fraction of output, δ is invested, that is, $S=\delta Y$. Further assuming the existing capital depreciates at that rate, the competitive equilibrium of the Solow model may be written as equation 5:

$$k_{t+1} - k_t = \frac{1}{1+n}\left[\delta f(k_t) - (\rho + n)k_t\right] \tag{5}$$

Where *n* is defined as growth rate

The left hand-side of equation (5) states that the change in capital stock per unit of labour, is determined by two terms on the right-hand side of the equation, where the first term $\delta f(k_t)$, is the actual investment per unit of labour, and the second

term, $(\rho + n)k_t$ is the breakeven investment, the amount of capital stock must be invested to keep the capital per unit of labour at its existing level. In steady state:

$$k_{t+1} = k_t \Rightarrow \delta f(k_t) = (\rho + n)k_t \quad (6)$$

When the breakeven investment is surpassed by real investment per unit of labour, kt-1>0, k rises until it reaches the level of steady state, and vice versa. Romer (2006) claimed that inevitably, regardless of where it begins, k would converge to its steady state stage. In the long run, when the economy converges at its steady state level of capital stock per unit of labour, real production rises at the same rate as the rate of population growth n. Given the assumption that the saving rate, population growth rate, and the CRS are constant growth rates, the Solow growth model notes that growth in key macroeconomic variables is dictated by the rate of population growth.

Solow (1956) breaks down output growth into three components, i.e. physical accumulation of resources, growth of labour force, and growth of total factor productivity (TFP), each recognizable as a contribution of one production factor. Growth in the TFP is assumed to be the consequence of exogenous technological change, which can also be expressed in productivity gains (Liu, 2007). Solow used the Cobb-Douglas production function to account for this and started from a simple growth equation. Thus applying the Cobb-Douglas function to the single equation *Y=f(A,L,K)* it gives equation (7):

$$Y = AK^{\beta}L^{\delta} \quad (7)$$

Where Y is output, A is Total Factor Productivity (TFP), K is capital stock and L is labour force. Solow then established his TFP as a technology and maintained

that the Cobb-Douglas production function is convenient to use because it shows constant returns to scale (Romer, 2006). The main point to note here is that, depending on the variables being analyzed, the variable A is not constant but varies with different production functions. In literature, like Brauninger (2002), Mansouri (2005), Fosu and Magnus (2006), Liu (2007) and Buscemi and Yallwe (2012), this output feature is widely used.

Empirical Model Used

The study applies the Cobb-Douglas production function in equation (7) and as has been used in other studies including; Brauninger, (2002); Mansouri, (2005); Fosu and Magnus (2006); Liu (2007) and Buscemi and Yallwe (2012) we specify the model as

$$Y_t = f\left(A_t^{\alpha}, K_t^{\beta}, L_t^{\gamma}, e_t^{\varepsilon}\right) \quad (8)$$

Where Y_t is output or economic growth, K_t, is capital, A_t is the total factor of productivity, L_t is the labour force, and e is error term and $\alpha + \beta + \gamma = 1$ reflecting constant returns to scale. The augmentation mentioned by the theory with reference to the equation is given by A_t and modelled as:

$$A_t = \text{f}\ (CPI_t, INT_t, RERt, TP_t) \quad (9)$$

To linearize and distinguish the equation, it is very useful to transform the output function into a growth equation for the purpose of estimation and in line with the study objective. Equation (9) would then be substituted into equation (8) and this would be equation (10)

$$A_t = CPI^{\beta 1} INT^{\beta 2} RER^{\beta 3} GEX^{\beta 4} TP^{\beta 5} \quad (10)$$

Substituting thins into equation 8, the equation will be

$$Y_t = \alpha CPI_t^{\beta 1} INT_t^{\beta 2} RER_t^{\beta 3} GEX_t^{\beta 4} TP_t^{\beta 5} K_t^{\beta 6} L_t^{\beta 7} \epsilon_t^{\mu t} \quad (11)$$

The study applied natural logarithm to equation (11) and estimated a log-linear model of the following form, which is in equation (12)

$$lnY_t = ln\beta_0 + \beta_1 lnINT_t + \beta_2 lnCPI_t + \beta_3 lnRER_t + \beta_4 lnTP_t + \beta_5 lnGEX_t + \beta_6 lnK_t + \beta_7 lnL_t + \beta_8 lnCPI_t^2 + \mu_t ln\varepsilon \quad (12)$$

Let lnβ = β_0, and ln ε = 1,

Then applying change to the equation as the theory stipulates, equation 12 would be given as

$$\Delta lnY_t = \beta_0 + \beta_1 \Delta lnINT_t + \beta_2 \Delta lnCPI_t + \beta_3 \Delta lnRER_t + \beta_4 \Delta lnTP_t + \beta_5 \Delta lnGEX_t + \beta_6 \Delta lnK_t + \beta_7 \Delta lnL_t + \beta_8 \Delta lnCPI_t^2 + \varepsilon_t \quad (13)$$

Here, the *ln* and Δ represent natural log and differencing respectively. CPI is inflation, INT is interest rates, GEX is government expenditure, RER is real exchange rates, TP is trade openness, K is capital, L is labour, and CPI^2 is the square of inflation.

Justification of the variables

Economic growth

Economic growth is characterized as the sustained increase in the real per capita overtime growth of a country (Oluba, 2008). Economic development, according to Dwivedi (2009), is a rise in an economic variable that usually persists over successive periods. Most studies use the GDP deflator and the consumer price index (CPI) to deflate nominal GDP interchangeably as an indicator of economic growth. Literature, however, implies that it is possible to

use actual gross domestic product as an accurate indicator of economic development (Barro, 1991). The GDP deflated by the CPI was used by Ahmed and Mortaza (2005) and Abd-Rahman (2012) as a measure of economic growth and indicated that it was easy and effective to use. In addition, real GDP is used as the proxy to capture production growth following previous work by Esso (2010). Thus, as an indicator of economic growth, the analysis uses real gross domestic product (RGDP) and is calculated by dividing nominal GDP deflated by the consumer price index (CPI). In the model, Y represents real GDP and also represents dependent variable.

Change in Consumer Price Index (CPI)

Inflation, as calculated by the adjustment in the index of consumer prices, represents the annual percentage change in the average consumer's cost of purchasing a fixed basket of products and services at prescribed intervals, such as on an annual basis. The change in the rate of inflation (annual CPI) reflects macroeconomic instability, which is why the model's consumer price index is used to measure inflation. A high rate of inflation is generally harmful to growth because it raises the cost of borrowing and thus lowers the rate of capital investment. However, the probability of such a trade-off between inflation and growth is minimal at low levels of inflation. Therefore, inflation is used to capture macroeconomic instability as an indicator (Asiedu, 2006). However, Bhat and Laskar (2016) also stated that inflation at some level is needed for growth. Thus the study expects inflation to have either negative or positive relationship with growth.

Interest Rate (IR)

For this analysis and also for the purposes of data availability, the interest rate is based on the prime rate; it is anticipated that it would have a positive or negative effect on economic development. Increases in interest rates increase costs of production and a rise in prices on the supply side all other things being equal, discourage demand for products. The neoclassical school views a negative relationship between interest rates and growth, thus lower lending rates entice investor to borrow and actually spur growth. Financial repression occurs, according to McKinnon (1973) and Shaw (1973), often when a nation introduces a deposit cap and loans nominal interest rates at a low level compared to inflation. The resulting low or negative interest rates prevent the mobilisation of savings and the channelling through the financial system of mobilised savings. This has a negative effect on investment quantity and efficiency and hence economic development. This hypothesis, therefore, suggests a major positive correlation in a closed economy between economic growth and real interest rates. Such a relationship is consistent with an approach to interest rate determination based on domestic loanable funds. Hence it is expected that interest rate be either negative or positive.

Effective Exchange Rate (RER)

The actual effective exchange rate is the weighted average of the currency of a nation compared to the index or basket of other global inflation-adjusted currencies. The real effective exchange rate used is based on trading partners in this study. The weakening currency would raise the payment burden and lead to

problems with the balance of payments and declines in other imports, thereby affecting economic development. The exchange rates inclusion in the model also caters for openness or liberalization of economy to other economies. Openness according to studies influences the growth of an economy in terms of the ease or mobility of how goods and services exit and come into the economy. Limited by data availability, the logic of the study was to use exchange rate because the exchange rate of a country may influence to a greater extent the level of trade openness a country would have. As a measure of the exchange rate used by this study, the real effective exchange rate is used (Jiménez-Rodríguez & Sánchez, 2005).

As goods produced in the economy become relatively cheap, exchange rate depreciation can lead to an increase in the export of goods and services. This would have a positive influence on the development of the economy. Domestic currency depreciation could also lead to a reduction in imports. However, the effect on the economy of exchange rate depreciation may depend on the country's balance of payment status. Hence, we expect that exchange rate could either be negative or positive.

Government Expenditure (G):

Government expenditure refers to general government spending at any level. It includes all purchases of goods and services by government agencies for current and future use, in order to meet, directly or indirectly, the individual or collective needs of the people of a particular country. This includes real goods and services bought from outside suppliers; jobs expenditure on state services such as

administration, security, and education; road repair, health, subsidies, grants, and debt servicing expenditure (Black, Hashimzade, & Myles, 2009). As a policy variable and also to complete the components of GDP, government expenditure enters the model.

The ratio of government spending to GDP is used in the analysis, following Easterly and Rebelo (1993) studies; Doh-Nani (2011). The Keynesian proposal suggests that an increase in economic growth would benefit from government spending. However, government spending could lead to a decline in economic growth due to the crowding-out impact on private investment and the inflationary pressures that it may lead to (Allen & Ndikumana, 2000). Nonetheless, all other variables remain unchanged and the study assumes a positive impact on growth following the Keynesian proposal.

Trade Openness (TP)

Trade openness is usually measured as a percentage of GDP as the number of exports and imports, but the measurement is already defined in some data (Commodore, 2016). Traditionally, openness to trade is expected to be favourably correlated with economic development. Openness to trade decreases inflation and its positive effect on production through increased foreign investment and improved resource allocation. It is also a way to allow foreign investment to flow into and outside the domestic economy. In that sense, some products or goods and services that the particular country may be able to produce or supply could be achieved from international sources and this is likely to improve the economic

growth of the domestic economy. The greater the openness, the higher the level of integration and benefits and the economic growth (Jin, 2000).

Gross Fixed Capital Formation (K)

Gross fixed capital creation (K) comprises factories, machinery and equipment, which was previously a gross domestic fixed investment. It also includes the construction of roads, railways, and others such as schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. The element is used as a capital stock proxy. Several other research, such as Aryeetey and Fosu (2005), and Mansouri (2005), have used gross fixed capital formation as a proxy for capital. Real GDP growth is expected to be positively affected by gross domestic capital formation. The higher the expenditure rate, the greater the economy's growth rate, all other things being equal. This is in line with both the predictions of neoclassical and endogenous development.

Labour Force (L)

Instead of population growth, the labour force (labour participation rate) is chosen because it denotes a proportion of the total population between the ages of sixteen (16) and sixty-four (64) and is the active and productive population of the country. The World Development Indicator (WDI) also described the participation rate of the labour force as the population aged 15-64. Solow (1956) and Swan (1956) advised that labour force should be included in an endogenous growth model because of its impact on the work force. This has been proved empirically in several researches that included labour force is a strong indicator of

economic growth (Kelly 1997; Ahmed & Miller 2000). The coefficient is expected to have a positive effect on growth.

Square of Change in CPI (CPI^2)

CPI^2 is the square of inflation, according to Bhat and Laskar (2016) and Lupu (2007) the relationship between inflation and growth is nonlinear. This is actually not a variable, but it was introduced to check for the non-linearity of the relationship that exists between inflation and economic growth. Thus it coefficient could either be positive or negative.

Description of Data Sources

The study employed secondary data from the World Bank. Annual time series data was collected from 1980 to 2016. The sequence was derived from the Development Indices of the World Bank (World Bank, 2018). This is because World Development Indicators (WDI) is the World Bank's main database of officially recognised foreign sources for development data. The choice of data coverage was also informed by the availability of data.

Data analysis and techniques

The study used the Autoregressive Distributed Lag (ARDL) model approach to the cointegration and error correction model to establish the relationship between economic stability and economic growth. The research also applied the Granger causality test within the cointegration system to test the path of causality between the two variables (economic stability and economic growth). To accomplish this, the analysis first examined the time series properties of the

data using the Augmented Dickey – Fuller (ADF) and the Phillip-Perron (PP) tests. The essence of this was to verify the data's stationary location. Like most time series data, it may lead to spurious outcomes if this is not checked. Secondly, the research continued to apply the ARDL cointegration approach and, ultimately, the granger-causality was also conducted to search for causality.

Unit root test

The pattern of the data was examined and stationarity tests and the order of integration were also taken into account. Regression also leads to the issue of spurious regression involving non-stationary time series (Enders, 2004). Therefore, when dealing with time series results, checking for the statistical properties of variables is very important. This goes to highlight the fact that data from time series are rarely at levels stationary. After all the variables were specified, the study employed a variety of unit root tests. Due to the inherent individual shortcomings of the different methods, this was done to ensure accurate results of the stationary test. The analysis used both the PP and the tests for ADF. Except that they vary with regard to the way they compensate for autocorrelation in the residuals, these tests are identical. The basic formulation of the unit root test by the ADF is specified as follows:

$$\Delta Y_t = \alpha_0 + \beta t + \rho Y_{t-1} + \sum_{i=1}^{q} \phi_i \Delta Y_{t-1} + \varepsilon_t \qquad (14)$$

Where; Y_t is the series at time t, Δ is the first difference operator, ε is the error term, while α, β, ρ, and ϕ are the parameters to be estimated. The ADF test, test the null hypothesis that a series contains unit root (non-stationary) against the alternative hypothesis of no unit root (stationary). That is

$H_0 : \rho = 0$ (Non-stationary or unit root)

$H_1 : \rho \neq 0$ (Stationary or no unit root)

The null hypothesis is rejected if the t-statistic is smaller than the critical values and the result is that the sequence is stationary. Conversely, the null hypothesis is accepted and the result is that the sequence is non-stationary if t-statistic is more than the critical values.

Autoregressive Distributed Lag

For the following three purposes, the ARDL approach to co-integration developed by Pesaran and Shin (1999) and further expanded by Pesaran, Shin and Smith (2001) was adopted for this research. Firstly, as opposed to other multivariate co-integration techniques such as the Johansen method, the procedure is simple, allowing OLS to estimate the co-integration relationship once the lag order of the model is defined. Second, unlike other techniques such as the Johansen approach, the ARDL procedure does not require pre-testing of the variables included in the model for unit roots. It applies regardless of whether the regressors were purely I(0), purely I(1) or mutually co-integrated in the model. In addition, for small or finite sample data sizes, the test is comparatively more efficient. The ARDL representation of the model is given below;

$$\Delta lnY_t = \beta_0 + + \sum_{i=0}^{n} \beta_1 \Delta INT_{t-i} + \sum_{i=0}^{n} \beta_2 \Delta lnCPI_{t=i} + \sum_{i=0}^{n} \beta_3 \Delta lnRER_{t=1}$$
$$+ \sum_{i=0}^{n} \beta_4 \Delta lnTP_{t=i} + \sum_{i=0}^{n} \beta_5 \Delta lnGEX_{t-i} + \sum_{i=0}^{n} \beta_6 \Delta lnK_{t-i}$$
$$+ \sum_{i=0}^{n} \beta_7 \Delta lnK_{t-i} + \sum_{i=0}^{n} \beta_8 \Delta lnL_{t-i} + \gamma_1 \Delta INT_t$$
$$+ \gamma_2 \Delta lnGEX_t \gamma_5 \Delta lnK_t + \gamma_6 \Delta lnL_t + \gamma_7 \Delta lnCPI_t^2 + \varepsilon_t$$

Granger Causality Test

Cointegrated variables must have an error correction representation, according to Engle and Granger (1987). One of the consequences of the Granger representation theorem was that one of the series would trigger the other if non-stationary series is co-integrated (Gujarati, 2001). For example, if X helps in the Y prediction, Y is said to be Granger-caused by X, or equivalently if the coefficient of the lagged X is statistically significant. Because of its broad applicability, the Granger Causality test has been used to analyze the path of causality between two linked variables (economic stability and economic growth). The test may be specified as below;

$$Y_t = \vartheta_0 + \sum_{i=1}^{p} \vartheta_1 Y_{t-i} + \sum_{i=1}^{q} \vartheta_2 X_{t-i} + \nu_t \quad (16)$$

Parameter Stability and Post-Estimation Tests

According to Alonso and Garcia-Martos (2012), it is important for a model to be tested or be stable before the model is used for policy. This as it were exonerates the model from spurious analysis. To this end, this study performed

similar test on the cointegration model that would be used. First, in time-series studies, serial correlation occurs when the errors associated with a given time period carry over into future time periods. In the view of Alonso and Garcia-Martos (2012), if serial correlation is not addressed in a model, the consequence may be that the model's efficiency will be affected. That is, the standard error estimates would be lower than the actual standard errors. This will lead to the conclusion that estimates of the parameters are more accurate than they really are. It is specified as:

$$S_r = \frac{\sum_{t=2}^{T}(\varepsilon_t' - \varepsilon_{t-1}')^2}{\sum_{t=1}^{T}\varepsilon_t^2}$$

Where T= the number of time periods, ε = error and t is the current time of the data or error.

It is necessary to remember that for the first observation in the sample, the numerator cannot provide a difference as no previous observation might be available. The definition follows the DW statistic again, where the DW statistic is between 0 and 4 levels, with no first-order serial correlation suggesting a value near 2. DW values below 2 and negative serial correlation with DW values above 2 are correlated with positive serial correlation.

Second, to test the stability of the model or parameter constancy, the cumulative sum of recursive residuals was used. The ARDL is often referred to as the boundary test model and can, as such, be ideal for testing the model's stability. The graphical approach to doing this test has been studied here. The cumulative sum of recursive residuals (CUSUM) and cumulative sum of recursive residual squares (CUSUMSQ) stability tests usually suggest that the calculated

model's coefficients are either constant over the study period or not within the essential limits. The parameter is not stable over time if the linear curve extends beyond either the lower or upper critical limits.

Chapter Summary

The chapter presented the methods employed to undertake the current research. First, the design of the study was explained and was the descriptive design. This was further followed by the theoretical framework for the model selection and then the empirical model selection. The study also explained the rationale or the justification for the choice of inclusion of all the variables together with how it was measured in the study. The study further mentioned that data for the study was a secondary data from the World Development Indicators by the World Bank in 2018. The study again mentioned that the ARDL technique was employed, however before the model was estimated all other parameter estimates or diagnostics were explained.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

Introduction

This chapter presents the results and discusses on how macroeconomic stability variables affect the economic growth of Ghana. The study first presented the summary statistics of the variable and then followed by the tests for unit roots in the variables using both the Augmented Dickey-Fuller (ADF) and the Phillips Perron (PP) tests. After that the study proceeded to estimate the models in the equations.

Descriptive Statistics of the Variables

The summary statistics of the data are described in Table 1, and the explanations or summary statistics are typically performed to verify the distribution of the variables. Table 1 showed that the mean values (means) of all the variables were positive. In terms of deviations, the results showed that the variables were minimally deviated from their means, with the exception of GDP and inflation, which had standard deviations of 19,697 and 45,937. The relatively small standard deviations mean that these variables have been slow to fluctuate over time. In addition, the Jarque-Bera statistics (probabilities) showed that, for all the variables, the null hypotheses of all the series except exchange rates (RER) and economic growth (GDP) were drawn from a random mechanism normally distributed and could not be rejected.

In addition, the results from Table 1 showed that except capital, trade oppeness and government expenditure that were negatively skewed, all the

variables were positively skewed. On the other hand, the essence of kurtosis is normally used to measure the number of outliers in the dataset. The interpretation of its resultant values reveals that if the value is usually more than 3, then the variable is not normally distributed. Again if a dataset has more heavy tails or outliers then there is a cause to worry however from the results, only GDP and RER had the kurtosis to be more than 3, the rests were all within reach confirming that the variables were normally distributed.

Table 1: Summary Statistics of the Variables

	GDP	RER	CPI	INT	K	L	GEX
Mean	104.8204	2.865727	3.30768	24.58284	18.30452	75.45040	13.89923
Median	95.89447	1.083000	1.00693	24.50000	16.96772	75.26200	14.44937
Maximum	7625.026	25.14000	156.5338	45.00000	29.81433	76.75100	17.67728
Minimum	0.396703	0.034400	0.04103	10.50000	3.749769	74.67100	5.861290
Std. Dev.	19.69769	4.989174	1.93763	9.082967	7.067087	0.635076	4.059318
Skewness	2.17054	3.03357	1.00010	0.68406	-0.03396	0.89968	-0.39679
Kurtosis	6.623462	12.60969	0.04109	2.957408	1.946720	2.661817	1.655335
Jarque-Bera	49.29398	199.1163	0.02510	2.888426	1.717439	5.167781	3.758429
Probability	0.000000	0.000000	0.142591	0.235932	0.423704	0.075480	0.152710
Sum	38780.58	106.0319	175.384	909.5649	677.2673	2791.665	514.2716
Sum Sq. Dev.	1.40E+08	896.1067	75969.56	2970.011	1797.974	14.51958	593.2103
Observations	37	37	37	37	37	37	37

Mensah (2019)

Results of the Unit Root Test

The stationary status of all the variables in the growth model defined for the study was developed in order to determine how interest rates, exchange rates, and inflation (economic stability) influence economic growth in Ghana. This was done in order to test for unit root on the variables using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests. While the boundary test method does not require the pre-testing of unit root variables, it was necessary to carry out a unit root test to verify that the variables were not integrated in an order greater than one. This will ensure that, if any, spurious regression results are prevented.

In order to formally determine their order of integration, the Augmented Dickey-Fuller (ADF) and Phillips and Perron (PP) tests were applied to all variables at the levels and at the first difference. For the determination of the optimal number of lags used in the test, the Schwartz-Bayesian Criterion (SBC) and the Akaike Information Criterion (AIC) were used. All the variables including; GDP (GDP), Inflation (CPI), interest rates (INT), exchange rates (RER), government expenditure (GEX), Labor force (L), and Capital (K) were all transformed to natural logarithm. The study used the P-values of the various tests for making the unit roots decision. The result of both tests for the unit roots for all the variables at their levels with intercept were presented on Tables 2 and Table 3.

Table 2: Augmented Dickey Fuller (ADF) test for the order of integration

Levels (Intercept only)			1st Difference (Intercept only)			
Var.	ADF-Statistic	Lag	Var.	ADF-Statistic	Lag	*IO*
LGDP	2.525981 (1.0000)	0	DLGDP	-5.015343 (0.000)***	0	*I*(1)
LL	-2.36321 (0.1578)	0	DLL	-6.471069 (0.000)***	0	*I*(1)
LCPI	-0.69545 (0.8375)	0	DLCPI	-4.355987 (0.001)***	0	*I*(1)
LTOP	0.36321 (1.2343)	0	DLTOP	4.33216 (0.001)***	0	*I*(1)
LINT	-1.62905 (0.4597)	0	DLINT	-5.962466 (0.000)***	0	*I*(1)
LGEX	-1.309369 (0.6149)	0	DLGEX	-5.03665 (0.0003)***	0	*I*(1)
LRER	1.509285 (0.5201)	0	DLRER	-7.122865 (0.0000)***	0	*I*(1)
LK	5.33216 (0.1578)***	0	DLK	-5.9769730 (0.000)***	0	*I*(1)

Note: *IO* represents integration order and D denotes first difference. ***, represent significance at the 1%.
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From Table 2, it could be observed that all the variables were stationary at first difference except capital (LK). That is, the variables were integrated of order one [*I*(1)] except the logged of capital (LK) which was stationary even at level. Normally because of certain challenges are usually associated with the use of ADF, the PP tests are done to verify the results of ADF, thus the results on Table 3 (PP test). Results on Table 3, the PP test statistics confirmed that all the variables were actually integrated of order one [*I*(1)] or stationary at first difference. Therefore, it is very clear that the method of differencing the variable once employed was able to eliminate the possibility of spurious regression results.

Table 3: Phillips Perron (PP) Test for the order of integration

Levels (Intercept only)			**1st Difference (Intercept only)**			
Var.	ADF-Statistic	BW	Var.	ADF-Statistic	BW	*IO*
LGDP	2.248168 (0.9999)	1	DLGDP	-4.819288(0.0003)***	0	*I*(1)
LGEX	-2.518639 (0.1179)	0	DLGEX	-3.665399 (0.0082)***	0	*I*(1)
LCPI	16.190880 (1.0000)	0	DLCPI	0.599245 (0.0213)**	1	*I*(1)
LTP	2.61321 (1.2343)	0	DLTOP	5.31216 (0.001)***	5	I(1)
LINT	-1.616788 (0.4659)	4	DLINT	-7.548819 (0.000)***	3	*I*(1)
LREX	1.194278 (0.9977)	4	DLRER	-4.207937 (0.0018)***	3	*I*(1)
LK	-1.286702 (0.6277)	2	DLK	-7.119895 (0.0000)***	6	*I*(1)
LL	-1.200665 (0.9977)	5	DLL	-4.213936 (0.0028)***	3	*I*(1)

Note: *IO* represents order of integration, *** represent significance at the 1%, and BW is the Band Width.
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Trends of Economic Stability and Economic Growth

On figure 2, the trends of other measures of economic stability was presented from 1980 to 2016. While the economic growth is represented with the bars, the other indicators were represented as lines. First, inflation rates, the figures suggest that rates of inflation since 1980s have been growing or increasing, just that between 1980 and 1995 rise in the rates of inflation were quite mild. Again beyond the year 1995, the rates of inflation have continued to rise but rather rise at an increasing rate. Figure 2 again showed that the curve dipped a bit in 2000 and 2004 perhaps due to change in government and austerity measure of reduction in government expenditures. The curve again dipped in

2007 when there was the redenomination of the local currency and then peaked in 2010 in the wake of the financial or banking crises. Between 2010 and 2013 there was steady rise in the rates of inflation before a sharp increase after 2015 and 2016 partly due to increase or expansion in government expenditures in the area of putting up infrastructure and the payment of interest payments.

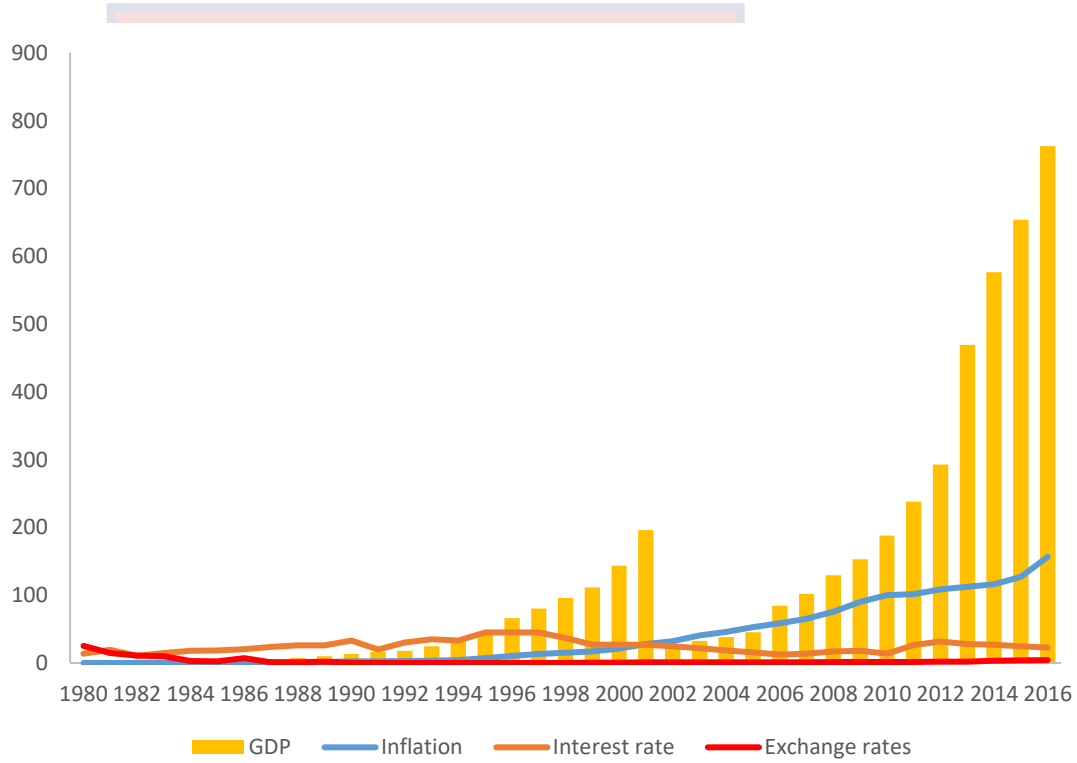

Figure 2: Trends of macroeconomic stability and economic growth

Mensah (2019)

In addition is the flow of interest rates and from the diagram, the movement of the interest rate curve has been undulating which is it rises and falls. The early stages of 1980s saw lower rates of interests below 10 percent in 1982, however the advent of the ERPs gradually made the interest rates to rise to 1990. The interest rate fell in 1991 and 1992 partly as results of the fixed exchange rates

regime to the partly flexible exchange rates. After 1992, the interest rate started rising again, and got to it maximum in 1995 where the interest rates were around 45 percent. This was also partly due to government efforts to mobilize enough funds to fund other deficits in the economy (Boakye–Gyasi & Li, 2017). Government however upon realizing that, that approach of getting money or borrowing from the local economy was not helpful, made plans to reduce the rates of interests and this saw the free fall on interest rates from 1995 to 2006 below 15 percent.

Interest rates increased again thereafter till 2009 when government saw the need to curb inflation in the economy by targeting inflation and increasing policy rates. This policy saw most of the investments being reduced to buying of government bonds and treasury bill notes and partially stabilizing the rising of prices (inflation) between 2010 to 2013. After 2013, other prudent measures have culminated in reducing the rate of interests to below 20 percent.

Moreover, the trends of exchange rates were also given. From Figure 2, there was a sharp fall in the exchange rate and of course the managed or fixed exchange rates regime was the reason (Boakye–Gyasi & Li, 2017). Even though the fixed exchange rates were responsible for the fall in the exchange rates, the advents of the Bretton Woods (IMF and World Bank) policies intervened as if the exchange rates were flexible. Even that one right after its introduction, the exchange rates fell again close to zero until 1990s when the fixed exchange rates regime made way for the near flexible exchange rates. Until then the exchange rates have enjoyed gradual rise.

Regarding the Figure 2, it was again showed that before 1996, the interest rates were over and above all the indicators (GDP, exchange rates, and inflation) and that was followed by inflation. In the same period, inflation was also higher than economic growth and exchange. This may give an indication that the increase in inflation and interest rates may not necessarily mean economic growth to some extent. After 1996 up to 2001, economic growth grew and even outstripped the macroeconomic variables. In the year 2001, interest rates dipped while inflation peaked. After 2002 economic growth reduced again and then starts increasing gradually. According to Aheto (2014), the fall in the economic growth after 2001 was as a result of the HIPC program that Ghana entered into. After 2006, economic growth exceeded rates of inflation continued to increase. Between 2006 and 2016 it was realized that though rates of inflation were increasing, economic growth was also rising while exchange rates continue to fall and the interest rates also falls.

Effect of Economic Stability on Economic Growth

The ARDL for co-integration has been used to achieve the objective of finding the impact of economic stability on economic growth in Ghana. Economic stability was calculated by the use of inflation, interest rates and exchange rates to demonstrate the focus of this analysis. In order to investigate the effects of economic stability on economic development, it is important to evaluate the presence of long-term equilibrium relationships between variables using the boundary evaluate. The results are presented Table 4.

Table 4: F-tests for co-integration

F-Statistic	K	Lower bound	Upper bound
9.3771	8	2.14	3.55

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Table 5 present the long-run ARDL (1, 0, 1, 0, 0, 0, 0, 1, 1) results on the model. It has log of real GDP as the dependent variable and log of exchange rates, log of labour, log of capital, log change in CPI (inflation), log of trade openness and log of government expenditure as independent variables. The results showed that all the variables, except exchange rates, were statistically significant in explaining the changes in economic growth. Moreover, although government spending and the rate of inflation have a negative effect on economic growth, interest rates, free trade, labour and capital have a positive impact on economic growth. The effect of the outcome is that a unit increase in government spending reduces economic growth by 1,6037 at the 1 percent significance level. Again, the capital log was also important in shaping long-term economic development, so that capital rises at a 1 percent significance level increased the country's economic growth by 0.38417.

Table 5: Long-Run Results ARDL (1, 0, 1, 0, 0, 0, 0, 0, 1) based on AIC. Dependent variable is LGDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LΔCPI	-0.2770	0.041	-6.743	0.000
LINT	0.46676	0.2212	2.335	0.051
LRER	-0.70349	0.6150	1.143	0.173
LTP	0.27026	0.02520	10.725	0.000
LL	0.1960	0.0860	2.270	0.033
LK	0.38417	0.12458	3.057	0.000
LGEX	-1.6037	0.02112	70.927	0.000
LCPISQ	-0.39594	0.52135	-0.759	0.471
C	0.78230	0.54004	1.448	0.132
R-squared	0.75311	Mean dependent var		10.20127
Adjusted R-squared	0.57230	S.D. dependent var		98.90626
S.E. of regression	109.3890	Akaike info criterion		13.30289
Sum squared resid	751.323	Schwarz criterion		12.60478
Log likelihood	30.21901	Hannan-Quinn criter.		13.41571
F-statistic	217.0067	Durbin-Watson stat		2.16300
Prob(F-statistic)	0.000			

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Moreover, on Table 5 log of labour was significant in affecting economic growth and at 5 percent significance level, a percentage increase in labour increase the economic growth by 0.1960. Trade openness as expected was also positive and significantly affecting economic growth. More specifically, a

percentage increase in trade openness increases economic growth by 0.2702 at a 1 percent level of significance. Interest rates have also been shown to affect economic growth positively and substantially. This is such that at 10 percent significance level, percentage increase in interest rate increase economic growth by magnitude of 0.46676 in the long run. Finally, the study revealed that economic growth is affected by inflation. The results show that a percentage increase in inflation changes (reduces) economic growth by 0.2770.0 at a level of significance of 1 percent. Therefore, the implication is that the more stable the economy becomes, the better it is for the economy.

The study also found that the sign of inflation on the square was negative, suggesting that there is a linear relationship between economic growth and inflationary economic stability. This also implies that the more such an economy regresses or declines in real GDP or economic growth, the more an economy becomes dysfunctional. This outcome eliminates the idea or view that inflation in its entirety may not be detrimental to growth. Generally speaking, price increases are encouraged by producers or suppliers, so if price rates rise to a point, producers would be prepared to supply and that would increase economic growth.

The results on Table 6 present the model's short-term estimates. The results revealed, in the short-term model, that trade openness and labour were not important in explaining changes in economic growth. That is, inflation shifts are increasing by 1%, improving economic growth by 0.0313 in the short run. Again, interest rates positively influence economic growth by 0.2666, and that a percentage increase in interest rates reduces economic growth in the short run by

the coefficient. Government expenditure was also significant in the short run and that at 1 percent significance level, a percentage increase in government expenditure increase economic growth by 0.158.

Table 6: Short-run ARDL model based on AIC. Dependent variable is DLGDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LCPI)	0.0313	0.0130	2.459	0.022
D(LINT)	-0.2666	0.11658	-2.288	0.007
D(LRER)	3.15308	0.75466	4.178	0.000
D(LTP)	-0.26821	0.3511	-0.764	0.512
D(LL)	0.02337	0.53470	0.043	0.870
D(LK)	1.88261	0.95770	1.965	0.069
D(LGEX)	0.1580	0.0250	6.270	0.000
D(LCPISQ)	-0.31655	0.59112	-0.535	0.790
ECT(-1)	-0.80823	0.11270	-7.172	0.000

Mensah (2019)

It has also been seen that the real exchange rate has a positive effect on economic growth. Here, any percentage increase in the exchange rate increases economic growth by 3.15308 at the 1 percent significance level. Finally, capital at 10 percent significance level improves economic growth. Here, percentage increase in capital increases economic growth by 1.8826. Again, the equation below is the error correction representation of the model in Table 6, since there

existed co-integration equation in the long-run model, it requires error correction model in the short-run to be estimated. The error correction equation calculates the error correction term for the adjustment to short run equilibrium.

ECM = LGDP + 0.0313*LCPI – 0.46675*LINT + 0.71345*LRER – 0.28026*LTP - 0.5446*LL - 3.38417*LK + 6.5180*GE + 1.2554*LCPISQ - 7.78230

It is important to state that the results on Tables 5 and 6 may not be entirely different from other empirical studies such as Doh-Nani (2011); Allen and Ndikumana (2000); FocuEconomic Outlook (2018); and Obansa et al (2013). For example, FocuEconomic Outlook (2018) noted that, in all types, exchange rates influence economic development. However, the findings contradicted the analysis of Kamin and Klau (1998) who indicated that it negatively affects economic growth and also went on the state that there was a bidirectional relationship between exchange rates and economic growth. In other research, using the IS-LM model, Hsing (2005) reported that there was a relationship between real GDP and selected macroeconomic variables that included Venezuela's real exchange rate. The study added that it was an important factor in the economic development of the world such that a weakening of the exchange rates means a down spiral of the country's economic growth.

In addition, FocusEconomic Outlook (2018) mentioned that exchange rates really affect a country's economic growth if the country's growth is dependents on trade openness (imports and exports liberalisation). In Africa Tarawalie (2010); Obansa et al (2013) reiterated that real exchange rates affect

Sierra Leone and Nigerian economies respectively. Although Obansa et al (2013) acknowledged that both interest rates and exchange rates were national indices of stability, their study maintained that because of their emphasis on trade on the Nigerian economy, exchange rates have a greater effect on economic growth than interest rates. Again, government expenditure was important from the results and that explains that government spending boosts the economy. For instance, Black et al (2009) mentioned that expenditures of government on employment, defense, education, road construction and maintenance, health, agriculture and the provision of other subsidies not only improve the standard of living but also improves the GDP (economic growth). Bhat and Laskar (2016) stated that though government expenditure could have a negative effect on growth in the long-run, in the short-run any government expenditure grows the economy. In spite of the enormous benefits government expenditure brings to economic growth, Allen and Ndikumana (2000) stated that government overly expenditures are likely to crowd out private investment and thus lower economic growth.

Inflation was also seen to be significant but negative to economic growth, implying that inflation is an important factor in reducing economic growth both in short-run and in the long-run. This stance of the study contradicts the views of Bhat and Laskar (2016) who maintained that inflation at some level is a need for growth. Logically where there is no increase in prices overtime, suppliers or produces would be discouraging to produces certain types of commodities. On that note, the production of certain necessities would not be produced instead; the supply of those commodities that command price may be supplied regardless of

their need to the people. The results again partly contradict the study of Doguwa (2012) who stated that inflation may be good for economic growth but at certain level or threshold it may become inimical to economic growth. The term for error correction measures the speed at which economic growth is adjusted. From the results, after 7 years or periods, the distortion in economic growth would return to equilibrium in the long run. It must be stated that the findings as it had posited in other studies acknowledged that inflation in deed affect the growth of an economy. The Gokal and Hanif (2004) study acknowledged that the relationship between inflation and economic growth exists.

Table 7: Post-estimation and stability tests of the model

Type of tests	LM version	F version
Serial correlation	CHSQ(4)=1.553 [.971]	F(5, 99) = .114 [.987]
Heteroscedasticity	CHSQ(1) = 1.271 [.197]	F(7,64) = 0.601 [.791]
Normality	CHSQ(2) = 7.481[.026]	Not applicable
Functional form	CHSQ(1) = 1.041 [.012]	F(4,59) = .680 [.762]

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Stability tests and other tests on the model were presented on Table 7 and were passed by the model. The adjusted R-square of the model, for example, indicates that the independent variables explained about 57 percent of the variations in the model. The Breusch-Godfrey Serial Correlation LM Test [F (7, 87) = 1.553; p = 0.971] again shows that there is no serial correlation in the model. Moreover, with the heteroscedasticity test, the probability value of the Breuch-Pegan-Godfrey test was used for decision making. Heteroscedasticity is a

concept used to characterize the case, according to Enders (2004), if the variance of the residuals from a model is not constant and this is not desirable. We failed to reject the null hypothesis of no heteroscedasticity from the findings. Furthermore, the normality test (p>.05) showed that the long-run model was normally distributed and therefore did not suffer from any normality problems. Finally, the cumulative sum of recursive residuals (CUSUM) and cumulative sum of recursive residual squares (CUSUMSQ) stability tests in Appendix A show that all the estimated model coefficients were stable over the study period since they were within the critical limits of 5%.

Granger causality between Economic Stability and economic growth

The Granger causality test was then applied after establishing co-integration between the variables to calculate the linear causation between economic stability (inflation, exchange rates, and interest rates) and economic growth (LGDP). Results of the Granger causality tests in Table 8 showed that the analysis had sufficient evidence to refute the null hypothesis that Granger does not cause economic growth (LGDP) with inflation (LCPI). Meaning, changes in inflation really influence the growth of an economy. However, the contrary, LGDP does not Granger cause LCPI could be rejected and this thus suggests that there is a unidirectional relationship between economic growth and inflation.

Table 8: Pairwise Granger causality tests

Null Hypothesis:	Obs	F-Statistic	Prob.
LINT does not Granger Cause LGDP	9	0.18701	0.6805
LGDP does not Granger Cause LINT		9.25125	0.0061
LCPI does not Granger Cause LGDP	12	6.41465	0.0321
LGDP does not Granger Cause LCPI		3.08222	0.1130
LRER does not Granger Cause LGDP	9	6.86538	0.0396
LGDP does not Granger Cause LRER		3.73357	0.1015

Mensah (2019)

Once again, the results have shown that exchange rates influence changes in Ghana's economic growth and not the other way around. The results failed to reject that LRER does not cause LGDP by Granger, but rejected the null hypothesis that LGDP does not cause LRER by Granger at the 5 percent significance level. This also shows that there is only one-way direction or unidirectional influence from exchange rates to economic growth. The results contradict the results of Syed and Anwar (2012) that suggested that rather it the change in interest rates that influence changes in economic growth. The argument stems from the fact that, for example, interest rate fluctuations affect investor decisions, an increase in interest rates will affect investment decisions, so that investors adjust the composition of their investment portfolios, typically from equity to fixed income securities, and that they definitely have an effect on economic growth. Again in the study of Gokal and Hanif (2004) it was emphatic

that there is a bidirectional relationship between macroeconomic stability herein represented as (interest rates, exchange rates, and rates of inflation) and economic growth.

The study of Chen and Qin (2016) supported the findings in that their study stated that exchange rates and inflation rates are important in influencing economic growth and that there was a one-way relationship between exchange rate and growth, then inflation and growth. Chen and Qin (2016) made it clear that inflation and exchange rate changes could lead to changes in economic growth instead. Moreover, this result of the study supports the study of Anaripour (2011) which employed a panel data of 22 countries for the period 2004-2010 maintained that there was a relationship between interest rate and economic growth. The results showed a negative relationship between interest rate and economic growth and this relationship was a unilateral causal relationship between economic growth and interest rate.

Chapter Summary

This chapter focused on the presentation of results and the discussion of the study. First the unit root properties of the variable were inspected using the ADF and the PP tests and the results showed that all the variables were stationary at order one or at first difference. Inflation, exchange rates, and inflation rates were measured as macroeconomic stability variables. Results showed that there was no co-integration between interest rates and economic growth. However, there were co-integration existing between exchange rates and economic growth

and then inflation and economic growth. There have been unilateral relations or causalities between inflation and economic growth in terms of granger causality, but interest rates and exchange rates have shown one-way causalities from economic stability to economic growth.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

The summary, conclusions and recommendations are presented in the chapter. Whereas the summary gives a brief overview of the problem of research, objective, methodology and findings; in the light of the hypotheses, the conclusions capture the overall results regarding the findings of the study. Specific remedies to be implemented by particular bodies are also presented in the recommendations.

Summary

This study calculated how Ghana's economic growth is affected by economic stability (interest rates, exchange rates, and inflation) using annual time series data from 1980 to 2016. The objectives of the study were to perform the trend analysis of economic stability and economic growth; estimate the impact of economic stability on economic growth; and to determine the granger causality between economic stability and economic growth. Using the ADF and the Phillips Perron tests, the data series were all subjected to time series stationary properties. It was revealed from the tests that all the variables were stationary at first difference. The research proceeded to estimate, using the ARDL model, the impact of economic stability on economic development. For the key findings;

- The study found that the trend of inflation has been gradually increasing for the period between (1980 and 2016). It was again seen that even though there were rise in inflation figures, the rise where just mild or

steady increase until after 1995 where it started to increase sharply. Inflation also dipped in period of cedi redenomination (around 2006 and 2007) and thereafter increased again.

- Interest rates were rather undulating or fluctuating with the highest or peak value in 1995 and the lowest in 1982. It was moreover seen that interest rates were low before 1990s where there were fixed exchange rate regime and low trade liberalization. After which it started rising again because of government efforts to mobilize money from the local economy.
- Unlike the inflation rates, exchange rates have been enjoying a downward spiral. That is, there was a sharp fall in the exchange rates and it was probably the cause of the managed or fixed exchange rates regime. Only that after the year 2000, exchange rates have been rising gradually and this was due to the more liberalization of the Ghanaian economy.
- The diagram on Figure 5 suggested that before 1996, the interest rates were over and above all the indicators (GDP, exchange rates, and inflation) and that was followed by inflation. After 1996 to 2001 economic growth grew and even outstripped the interest rates, inflation and exchange rates variables. In that same year 2001 interest rates dipped while inflation peaked.
- For the effects of using the ARDL, first the study revealed that there was co-integration and thus the long-run, short-run and error correction models were estimated.

- In the long-run inflation, labour, capital, trade openness, interest rate government expenditure and economic stability were significant in explaining economic growth. However, all the variables were positive except exchange rate and government expenditure which were negative.
- In the short-run model, only economic stability (ie, interest rate, exchange rate and capital) were significant. Again the error correction term was negative and significant implying a convergence to equilibrium of any disequilibrium in the previous year.
- In terms of the granger causality, there were unilateral relationships or causality between the inflation and economic growth, however, interest rates, and exchange rates showed a one-way causality from economic stability to economic growth

Conclusions

The aim of the study was to determine how economic stability influences economic growth in Ghana. Macroeconomic stability variable measured by the rates of inflation, exchange rates, and interest rate. In order not to over rate the relationship between economic stability and economic growth, the ARDL model was used and co-integration were tested. The study revealed that while the trend of interest rates had been non-linear, that of inflation and exchange have been partly linear, only that exchange rates tended to be downward while inflation was increasing.

The results showed that the current co-integration between economic stability and economic development has taken place. In the long-run model it was

pointed out that excluding exchange rates, all the other variables (interest rates, government spending, labour and capital) were important. It was only government spending that had a negative impact on growth. Economic stability has also been a positive factor affecting a country's economic growth. Nevertheless, inflation has been negative but significant in the short term, suggesting that macroeconomic volatility has a negative effect on short-term economic development. Interest rates and exchange rates were also variables that were found to have a significant impact on economic growth in the short term. There were unilateral links or causalities between macroeconomic stability and economic development in terms of granger causality.

Recommendations

Based on the conclusions and findings of the study, the following recommendations were made;

1. Government of Ghana through the Bank of Ghana should continue targeting inflation since stable inflation is important and also crucial to the economic growth. It is therefore important that government do every possible to keep inflation levels that may spur economic growth.
2. The fluctuations in interest rates have the tendency of adversely affecting economic growth of a country by distorting the stability of the economy. The study therefore recommends that government be circumspect in its internal borrowing.

3. Government expenditure was significant both in the short and long run, implying government must apply caution to its entire expenditures, because in the long run expenditures that turn not yield revenue become inimical to growth.

Direction for further studies

It is worth mentioning that this study measured economic stability by rates of inflation, exchange rates, and rates of interests. However, there are other variables such as unemployment that can also explain economic stability, thus further studies can look at how to measure economic stability in order not to lose the essence of the variable.

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APPENDIX

Plots for CUSUM and CUSUM SQUARE