UNIVERSITY OF CAPE COAST

ASSESSING THE EFFECTS OF EXCHANGE RATE VOLATILITY ON

FOREIGN DIRECT INVESTMENT IN GHANA

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FOREIGN DIRECT INVESTMENT IN GHANA

BY

JOYCE KORKOR GIDIMAJOR

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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
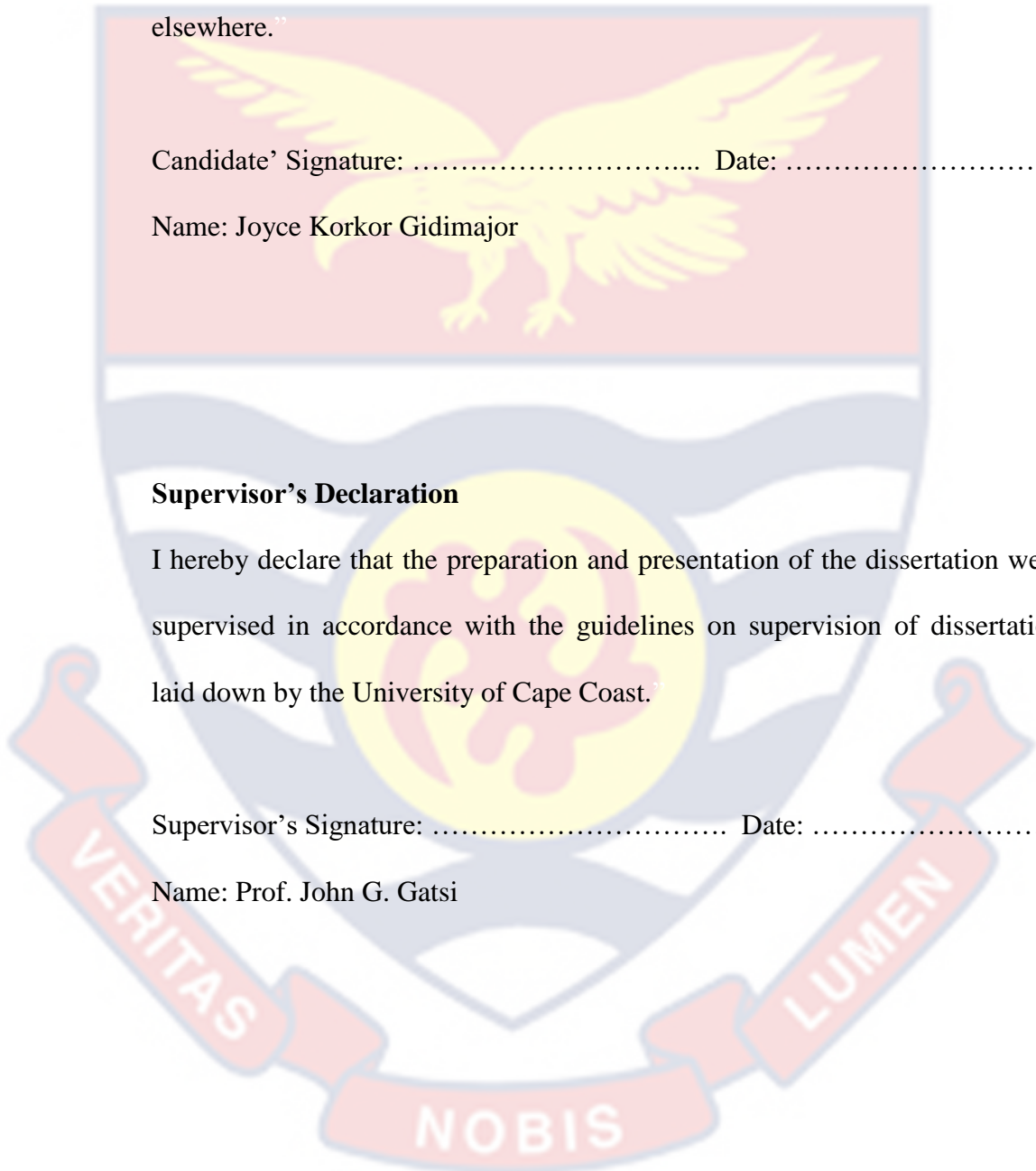
elsewhere."

Candidate' Signature: …………………….... Date: …………………………

Name: Joyce Korkor Gidimajor

Supervisor's Declaration

I hereby declare that the preparation and presentation of the 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: Prof. John G. Gatsi

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ABSTRACT

The study analyzed the effect of exchange rate volatility on foreign direct investment of Ghana. In order to achieve the purpose of the study, three objectives were stated. The first objective was to analyze the long run impact of exchange rate volatility on foreign direct investment of Ghana. The second objective of the study was to analyze the short run impact of exchange rate volatility on foreign direct investment of Ghana. Thirdly, the study objective was analyze the causal relationship between exchange rate volatility and foreign direct investment of Ghana. Control variables including Gross Domestic Product, interest rate, inflation rate and Investment Freedom. The annual data for exchange rate, interest rate, inflation, FDI, GDP and investment freedom were downloaded from WDI, IMF databank and GSE websites. Secondary data from 2000 to 2021 were employed. Unit root test was run to analyze the stationarity of the variables. ARDL was appropriate for the study. The Granger causality test was also used to analyze the causal relationship between exchange rate volatility and foreign direct investment. The study found that exchange rate inflation, and interest rate had a negative long run effect on foreign direct investment. GDP had no significant effect on foreign direct investment. In the short run, lag 1 of stock return was positive and significant on current foreign direct investment. Exchange rate had a negative and significant effect on foreign direct investment. Finally, the study found that there was a unidirectional causal relationship between foreign direct investment and interest rate, inflation and exchange rate. The study recommended that the central bank should put in measures to reduce the inflation rate.

KEYWORDS

Exchange rate volatility

Foreign Direct Investment

Interest rate

Inflation rate

Ghana

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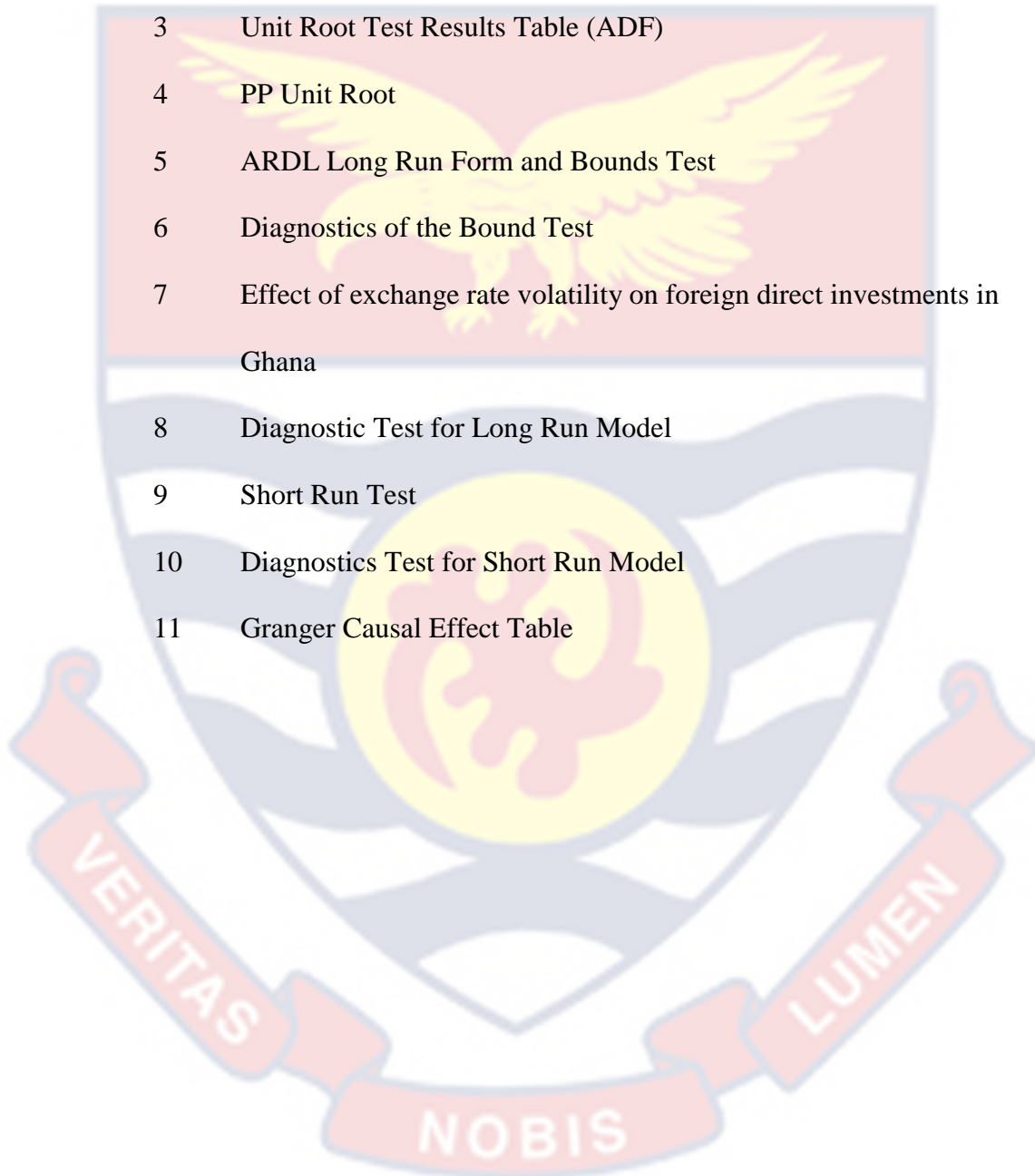
DEDICATION

To my husband

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CHAPTER ONE

INTRODUCTION

This chapter introduces the topic of the study, "Assessing the Effects of Exchange Rate Volatility on Ghana's External Trade and Investment Flows." It provides an understanding of the problem at hand, the background, the research questions and objectives, and the significance of the study. It also delimits the scope of the study and describes the research methodology that will be utilized in this research. Lastly, the structure of the study is outlined.

Background of the Study

Ghana, located in West Africa, has emerged as one of the fastest-growing economies in the world. This growth has been driven by a diverse economic base, including significant contributions from the agricultural, mining, manufacturing, and service sectors (World Bank, 2022). Ghana's wealth in natural resources, such as gold, cocoa, and oil, has attracted significant foreign investment and has positioned it as a key player in global trade (African Development Bank Group, 2021).

The export sector plays a crucial role in Ghana's economy, with cocoa and gold constituting the lion's share of export commodities. Ghana is the second-largest cocoa producer in the world, and gold exports contribute significantly to the nation's Gross Domestic Product (GDP) (Anim, 2021). Oil production, initiated in 2010, has added another major export commodity to Ghana's portfolio, further boosting its economic outlook (Gyapong & Karimu, 2020). On the other hand, Ghana is heavily dependent on imports for a broad range of goods, including capital and consumer goods, food, and petroleum products. The increasing openness of Ghana's economy to global trade and

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investment makes it vulnerable to the impacts of exchange rate volatility. In fact, fluctuations in the Ghanaian cedi against major international currencies can significantly affect the cost of imports and the returns from exports (Osei, 2018).

In recent decades, Ghana has experienced increasing levels of foreign direct investment (FDI) due to favourable government policies and attractive investment opportunities, particularly in the mining, telecommunications, and manufacturing sectors (UNCTAD, 2021). However, exchange rate volatility can have a significant impact on FDI flows into the country. Exchange rate risk is a key consideration for multinational enterprises and investors when making decisions about international investment. A volatile exchange rate can deter potential investors, as it adds to the uncertainty and risk associated with the investment (Mensah & Tribe, 2019).

The exchange rate of the Ghanaian cedi against the U.S. dollar has shown considerable volatility in the past two decades. This has been due to various factors such as fluctuating commodity prices, inflation differentials, changes in interest rates, and varying perceptions of political and economic stability (Adu et al., 2018). The unstable exchange rate has presented challenges for both policymakers and businesses. Policymakers are tasked with maintaining a stable economic environment to attract foreign investment and promote trade. At the same time, businesses, particularly those involved in import-export activities or those receiving or making investments, must navigate these exchange rate fluctuations, which can affect their profitability and competitiveness (Ackah & Asiamah, 2019).

Despite the potential implications of exchange rate volatility on Ghana's economy, there is a noticeable gap in the empirical literature specifically focused on this subject. While some studies have examined the effects of exchange rate volatility on trade and investment in other developing countries (Aizenman, 2002; Aggarwal, 2008), comprehensive research focusing on the case of Ghana remains limited. This gap presents a clear need for this research to further elucidate the effects of exchange rate volatility on Ghana's external trade and investment flows.

Statement of Problem

The exchange rate serves as one of the principal determinants of a nation's level of trade and economic health. It can affect many aspects of a nation's economy, including inflation rates, interest rates, public and private sector investment, and even the level of economic growth (Copeland, 2008). Volatility in exchange rates, therefore, can have broad and far-reaching impacts. In particular, developing countries like Ghana, with their heavy reliance on exports and imports and on foreign direct investment, can be considerably affected by exchange rate volatility.

Previous studies have explored the relationship between exchange rate volatility and trade at a global level, with mixed findings. Some studies have found a negative correlation between exchange rate volatility and trade (Auboin & Ruta, 2013), while others have found no significant correlation (Bahmani-Oskooee & Hegerty, 2007). However, these studies tend to examine the issue from a global or regional perspective, with less emphasis on specific national contexts. Consequently, the nuanced impacts of exchange rate

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volatility in individual countries, especially in the developing world, are not comprehensively understood.

In the context of Ghana, studies have mainly focused on the causes and effects of exchange rate volatility in general (Agyapong, Adu, &Marfo-Yiadom, 2011), without explicitly examining its impacts on external trade and foreign direct investment. This gap leaves an incomplete understanding of the specific implications of exchange rate fluctuations on Ghana's economy. Moreover, most of the extant research investigates the general effects of exchange rate changes rather than focusing on periods of high volatility, which may have unique and significant implications for trade and investment.

Additionally, while there have been studies on the effect of exchange rate volatility on foreign direct investment globally (Benassy-Quere et al., 2007), there is a lack of such research specific to Ghana. Given that Ghana has been experiencing a surge in foreign direct investment flows, understanding how exchange rate volatility may influence these flows is crucial. In essence, there is a substantial research gap in understanding the impact of exchange rate volatility on external trade and investment flows in the specific context of Ghana. The problem, therefore, lies in the dearth of empirical studies that delve into how fluctuations in exchange rates affect Ghana's external trade and foreign direct investment flows.

Purpose of the Study

The main purpose of the study was to analyse the effect of exchange rate volatility on foreign direct investment in Ghana.

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Research Objectives

Specifically, the study sought to achieve the following;

1. To examine the long-term impact of exchange rate volatility on foreign direct investment flows in Ghana.

2. To analyse the short-term impact of exchange rate volatility on Ghana's external trade.

3. To analyse the causal relationship between exchange rate volatility and foreign direct investment flows in Ghana.

Research Hypotheses

1. There is a no significant long-term impact of exchange rate volatility on foreign direct investment flows in Ghana?

2. There is no significant short-term impact of exchange rate volatility on Ghana's external trade.

3. There is a significant causal relationship between exchange rate volatility and foreign direct investment flows in Ghana?

Significance of the Study

The study of exchange rate volatility's impact on external trade and foreign direct investments (FDIs) in Ghana is significant for several reasons. Firstly, understanding this relationship is crucial for effective policy making. The Ghanaian government, like many developing nations, uses trade and foreign investments as key tools for economic growth and development (Bouoiyour&Selmi, 2014). Thus, a thorough understanding of the impact of exchange rate volatility on these critical aspects of the economy can guide policy formulation, enabling the government to adopt policies that mitigate negative effects and harness positive ones. For instance, policies could be

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developed to stabilize the exchange rate, if such stability is found to encourage trade and investment.

Secondly, this study is important for the business community, particularly firms engaged in external trade and those seeking or providing foreign investments. Businesses need to manage the risks associated with exchange rate volatility, and a clear understanding of the impacts of these volatilities could help them devise effective risk management strategies (Hyder & Mahboob, 2005). This is particularly critical for firms that engage in international transactions, as their profit margins and overall competitiveness can be significantly affected by fluctuations in exchange rates.

Finally, this research contributes to the academic literature on exchange rate volatility and its impacts on external trade and FDIs. While a significant body of research exists on the subject in a global context (Bah &Amusa, 2003), studies specifically focusing on Ghana are notably scarce. Therefore, this study can provide a more nuanced understanding of the subject within the Ghanaian context, contributing to the body of knowledge in this field and potentially paving the way for further research.

To sum up, the study's findings will provide much-needed insights for policy makers, businesses, and academic researchers regarding the effects of exchange rate volatility on Ghana's external trade and investment flows.

Delimitation of the Study

The scope of this research is centered on assessing the effects of exchange rate volatility on Ghana's external trade and investment flows over a 23-year period, from 2000 to 2023. This period is chosen for several reasons. First, it includes both periods of relative stability and instability in the global

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economy, allowing the study to capture the effects of varying economic conditions on exchange rate volatility. Secondly, it aligns with the period during which Ghana began to experience significant growth and diversification in its economy (Jebuni et al., 2004).

In this research, the focus is particularly placed on the exchange rate volatility of the Ghanaian cedi against the US dollar, primarily because of the US dollar's prominence in international trade and its role as the benchmark currency (McBride &Sergie, 2021). Understanding this relationship is essential as fluctuations in the cedi-dollar exchange rate could have wide-reaching implications for the country's trade and investment dynamics.

The scope is not limited to the aggregate level of trade and investment flows but extends to a disaggregated level. This involves examining the effects of exchange rate volatility on different sectors of Ghana's economy. Earlier studies suggest that some sectors may be more vulnerable to exchange rate changes than others (Agyapong, 2011). Therefore, understanding sectoral differences in response to exchange rate volatility could provide more nuanced policy recommendations.

Furthermore, while the focus is on Ghana, findings from this study could potentially be generalized to other similar economies in sub-Saharan Africa. This is due to similarities in economic structures and the challenges these economies face in terms of exchange rate volatility and its impacts on trade and investment (Coulibaly, 2012).

In conclusion, this study's scope is carefully defined to provide a comprehensive assessment of the effects of exchange rate volatility on Ghana's external trade and investment flows. The focus on the cedi-dollar

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exchange rate, the period under study, and the consideration of sectoral impacts all contribute to the breadth and depth of the research.

Limitations of the study

Limited availability of long-term historical data on exchange rates and foreign direct investment (FDI) in Ghana may affect the robustness of the analysis. The quality and reliability of the available data from different sources might vary, potentially leading to inconsistencies in the results.

Different methods of measuring exchange rate volatility (e.g., standard deviation, GARCH models) can yield different results, and the choice of method might influence the study's conclusions.

Definition of Terms

Exchange Rate Volatility: The degree of variation of exchange rates over time, reflecting the extent to which a currency's value fluctuates against another currency. Exchange rate volatility refers to the fluctuations in the value of the Ghanaian cedi relative to other currencies, and how these fluctuations influence the decisions and behavior of foreign investors.

Foreign Direct Investment (FDI): Investment made by a firm or individual in one country into business interests located in another country, typically involving significant ownership or managerial control. FDI in this context refers to the investments made by foreign entities in Ghanaian businesses, which may include establishing new ventures, acquiring assets, or expanding existing operations in Ghana.

Organisation of the Study

The study was organized into five chapters. Chapter One consists of the background of the study, the statement of the problem, objectives of the

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study, significance of the study and limitation of the study. Chapter Two was on a review of related literature. This chapter provides the fundamentals of the study and therefore help to shape the nature and direction of the study. Chapter Three was on the research methods of the study. It covers the research design, the population and sampling procedures, data and data collection procedure, research instruments, as well as method of data processing and analysis. Chapter Four was on results and discussion of the study whiles Chapter Five was on the summary of the findings, conclusions and recommendations for the study.
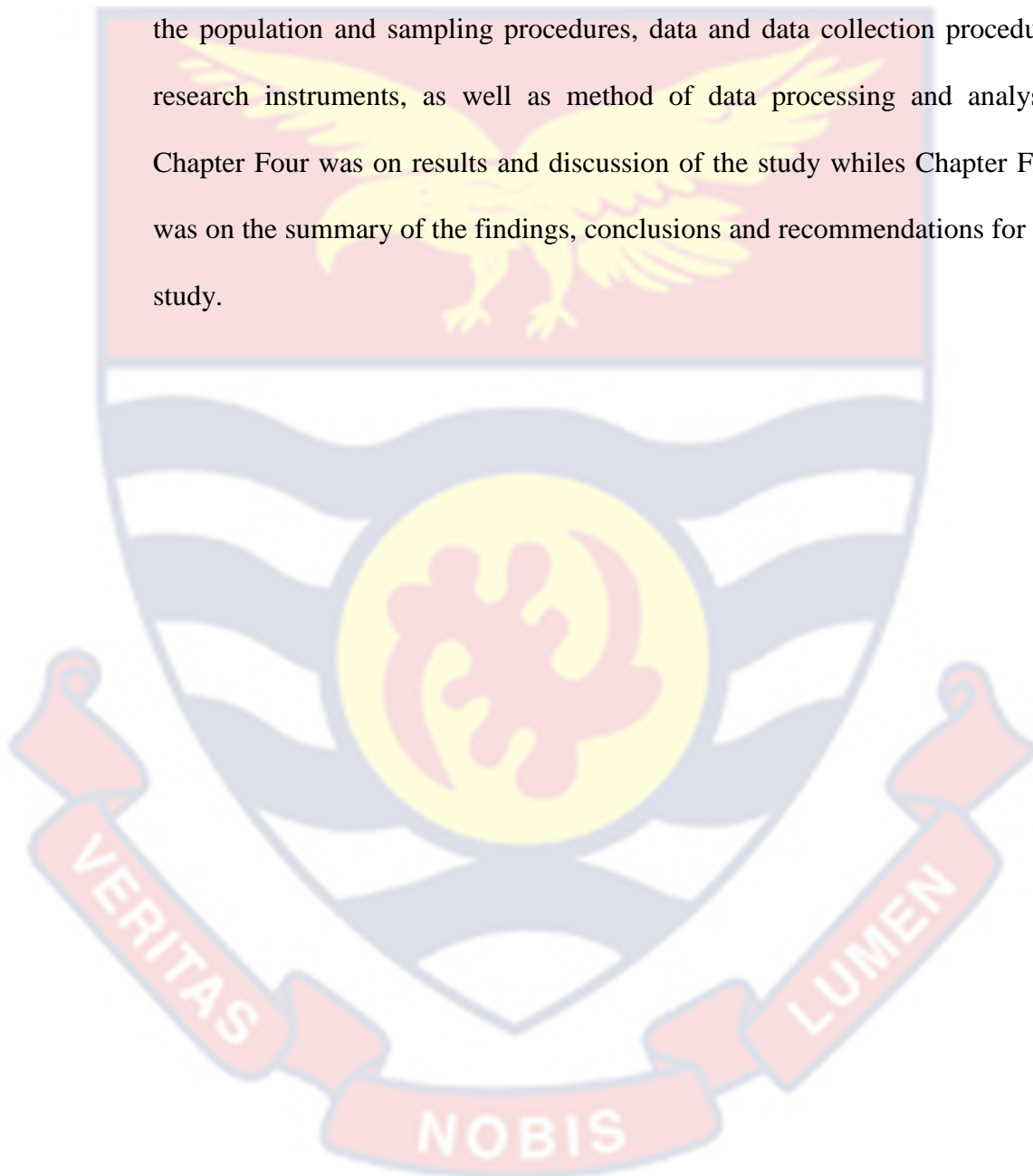
CHAPTER TWO

LITERATURE REVIEW

Introduction

The main focus of this chapter is to present the review of relevant literature on the relationship between exchange rate volatility and foreign domestic investment. The first sections look at the overview of the exchange rate volatility and foreign direct investment in Ghana. The second section reviews the literature on the exchange rate volatility and foreign direct investment in Ghana. The last section reviews empirical literature with particular emphasis on investment.

Theoretical Review

The study was centered on Keynesian theory of investment and Endogenous Growth Theory (EGT).

Keynesian Theory of Investment

The Keynes (1936) theory of investment is based rationale that decisions of investment are taking by comparing the MEC to the yield of the real interest rate (Tsoulfidis, 2008). As longs as the MEC is greater than r, investment in plants, equipment and machinery will take place. However, the law of diminishing marginal product of capital sets in when more and more of capital is employed in the production process as the MEC begins to fall. The MEC will fall to a point where it is equal to r, at that point no new investment will be made in any income-earning asset. Thus, a lower real interest rate reduces the borrowing cost hence investors will invest more at such lower rates whiles higher real interest rate increases the borrowing cost making it difficult and unprofitable to finance investment.

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The theory is based on three main assumptions the cost of borrowing, the returns on investment and the expected return on new capital (MEC). According to Keynes theory, investment is unpredictable and subject to the firm's anticipation of the investment venture profitability, if the anticipated profit on investment surpasses the financing cost, they are bound to invest (Dapaah-Yeboah, 2016). However, he also viewed the firm's investment based on whether investors are optimistic or pessimistic about the prospects of the economy. In times of economic boom, investors anticipate the rapid expansion of the economy and the demand for their products to continue. They invest more in response to this favourable condition by increasing the capacity of their production through high levels of investment in new capital which lead to expansion.

According to Keynes, aggregate demand theory demand is greatly influenced by output so as output increases demand also increases. Eventually, this optimistic expectation does not correspond with the economy's ability to sustain the expansion. As the economy begins to slack back firms are left with excess capacity to produce an unrealistic high volume of output. So they stop investing, output declines so does demand, firms become more pessimistic about the economy keeping investment at the minimum level possible (Parker, 2010).

Endogenous Growth Theory

This study is underpinned by the Endogenous Growth Theory (EGT), specifically the Solow Growth theory, which offers explanation to the forces that determine the long run growth of a country. This theory was propounded by Romer (1987) and advanced by Aghion and Howitt (1992) and Grossman

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and Helpman (1991). According to the endogenous growth theory, the economic growth of a country in the long run is determined by factors that are internal to the economic system. The theory further proposes that the long run economic growth of economies can be determined by economic forces including exchange rate. The theory begins from the premises that technological advancement occurs through investment in new markets, ideas, processes and products which come about as a result of economic activities (Aghion & Howitt, 1992). For firms to produce efficiently there is the need for the exchange rate to be stabilized so that losses arising from exchange rate risk in respect of international transactions will not occur. A stable exchange rate can improve the efficiency of the productive sector which in turn speeds up the pace of economic activity.

Furthermore, the endogenous growth theory lays much emphasis on innovations, research and development. It observes long run economic growth as a function of rapid innovation that is backed by rigorous research and development. But it must be noted that research and development expenditures are enormous and the extent to which firms can embark on research and development for innovations depends on the economic indicators of the country. This is the point where exchange rate plays important role in affecting the long run growth prospects of the economy.

For importing firms, deterioration of the exchange rate increases their cost of doing business and that negatively impacts on their ability to deploy research and development to discover new products and new markets. The inability to catch up with the technological trend, innovation and new products generally affects the growth path of the economy. On the contrary, for

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exporting firms firm, the deterioration of the exchange rate represents extra cash flows and that enables them to invest in research and development to discover new products and markets; and the growth path of the economy is positively affected.

On the contrary, the strengthening of the exchange rate serves as good news for importing firms through cost savings which enables them to invest extra cash in research and development for the purposes of innovation and new discoveries in the market economy. Exporting firms on the other hand suffer from appreciation of the domestic currency through reduced cash flows and the overall impact of this on the endogenous growth theory is that the pace of innovations of such firms will slow down. In summary, the endogenous growth theory suggests that the long run growth of the economy is a function of the rate of innovation of the market which is also determined by the economic conditions in the country. Hence, the movements in the exchange rate affect the innovation process of the economy and the economic growth of the economy responds accordingly to these movements. The theory of endogenous growth therefore serves as the basis for analyzing the short run and the long run relationship between exchange rate volatilities and economic growth in Ghana.

Conceptual Review

The concepts underpinning the study has been explained under the concept. The exchange rate volatility and foreign direct investment has been explained under the section.

Exchange rate in Ghana

Ghana withdrew its membership from the Board of West African Pound, after gaining independence in 1957 from the British; the BOG was instituted to be the sole monetary authority in Ghana (Abdul-Salam, 1970). As a new monetary authority, the Central Bank of Ghana introduced the Ghanaian pound shilling and pence on July 14, 1958, as the new national currency to replace the West African Pound (Obuobi, Nketsiah, Awuah, Oteng, Ofosu, Adu-Gyamfi, Adjei & Amadi, 2020). The Ghanaian pound shilling was fixed to the British pound, as a medium of exchange and transaction between the Ghanaian people and the British from 1958 to 1966. Subsequently, as the world moved towards globalization and international trade, the American dollar became an international unit of exchange.

International trade and transactions were valued in dollars. So, from the period of 1966-1982, the Ghanaian exchange rate was fixed to the dollar, under this arrangement the local currency was fixed to the American dollar at the predetermined rate by the Bank of Ghana. The Central Bank of Ghana used their administrative tool and power to absorb external shocks and the uncertain market conditions to maintain the rate of exchange (cedi-dollar) at a particular fixed and desirable rate (Antwi-Asare & Addison, 2000).

From 1983-1986 Ghana moved to the multiple exchange rate system. Under this system of the exchange rate, the country engaged in both the fixed and the floating exchange rate at the same time. However, markets and transaction were divided into different categories with their exchange rates. For example, importation of crude oil, essential raw materials, and traditional exports were exposed to a different exchange rate compared to non-traditional

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export and other imports (Sanusi, 2010). The exchange rate policies in Ghana were affected by several constitutional structures and regimes since colonial independence (Buabin, 2016).

In 1986 Ghana made another transition in their exchange rate system two similar but different exchange rate system. This system came with two exchange rate windows. Whiles one window operated a fixed exchange rate where ¢90:00 was pegged to US$1.00. The window two operated a floating exchange rate, where the unpredicted market conditions were allowed to operate freely in a weekly auction conducted by the Bank of Ghana. From February 1987, the two windows were eventually merged and the rate was determined at the auction. The first rate determined at the auction in September 1986 was ¢l20 to the dollar and by December 1989 the rate had depreciated to ¢300 (Sowa, 1999).

The dual exchange rate system could not stand the test of time, as it increases the activities of those that operated in the black market rather than reducing their activities. So, in a space of 7 months, the dual exchange rate was abolished (Dordunno, 1994). The Dutch auction system took over in 1988-1989, the banking system was the main channel through which all transactions were conducted and resolved at the additional rate influenced by the weekly auction (Obuobi et al., 2020). Basically, with the Dutch auction system, the auctioneer starts with a higher price and eventually reduces the price to a point where some participant can afford.

On March 1990, as a replacement for the weekly-retail auction, the wholesale auction was launched. Under the wholesale auction, a complex rate of exchange system was operated which comprises of the inter-bank and a

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wholesale system. Approved banks and qualified bureaux were allowed to purchase foreign exchange from the Bank of Ghana and sell to their customers and sometimes even among themselves (Harrigan & Oduro, 2000). The wholesale auction system was abrogated and supplanted by the inter-bank market in April 1992, where business and forex bureaux worked in a competitive environment (Fiagboh, 2013). This was the final process of exchange rate market reforms in Ghana.

Exchange rate volatility in Ghana

Exchange rate in Ghana is at the heart of the management of the Ghanaian economy. The reason for the overarching relevance of exchange rate in Ghana is as a result of the volumes of importation of goods and services that come into the country on yearly basis (Antwi, Boadi & Koranteng, 2013). For instance, in 2017 the total import of goods into the country was US$12.65 billion but there was an increase of import of goods in 2018 by 3.5% to US$13.09 billion (Bank of Ghana Annual report, 2018). The consistent import volumes in Ghana exert pressure of the domestic currency, and the result has been the balance of payment deficit problems. The compounded problems in respect of the pressures on the domestic currency have triggered some economic actions in the past. For example, the cedi was devalued in 1971 and shortly after revalued by 29% (Antwi, Boadi & Koranteng, 2013). Figure 1 depicts the exchange rate movement (depreciation) over the period of 1980 to 2018.
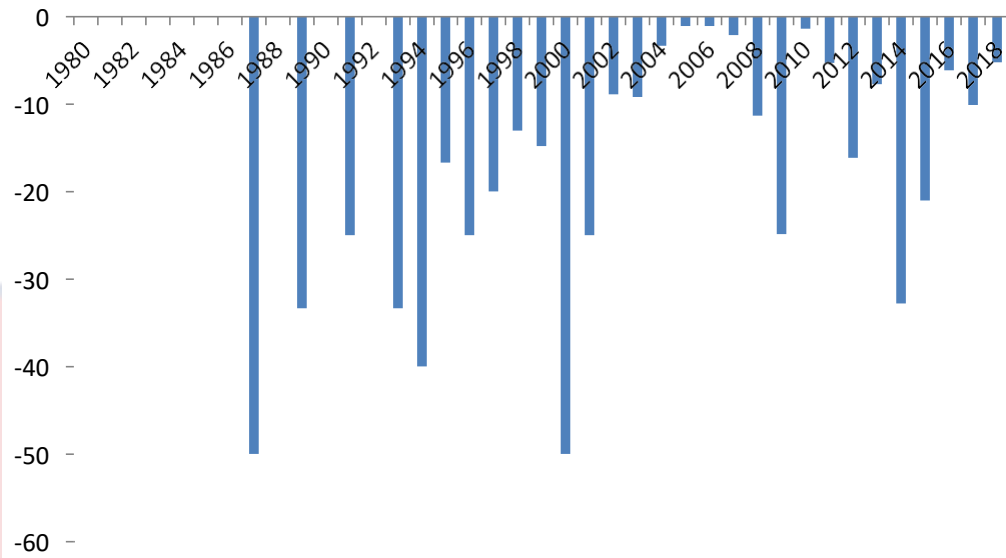
Figure 1: Exchange rate movement from 1980 to 2018
Source: Author (2020)

Figure 1 provides the pictorial view of the exchange rate movements in the Ghana cedi and the United States dollar from 1980 to 2018. Effective from 1987 the cedi depreciated by 50% against the US dollar and again by the same margin in the year 2000. Figure 1 further reveals that the depreciation of the cedi against the US dollar is feature of the exchange rate system in Ghana. For over three decades the Ghana cedi has constantly depreciated against the US dollar and this consistent depreciation have implications for the productive sector for the economy, especially those who purchase raw materials from the overseas market for production. As Figure 1 shows, the depreciation rate of the cedi against the dollar for the 1980s and the 1990s are more severe than the trends in the 2000s. The dynamics in the exchange rate is therefore worthy of comparison to the growth rate of the economy so that the impact is assessed accordingly.

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Empirical Review

Exchange rate volatility over the years has been quite debatable, especially with its impact on various indicators of the economy. This has motivated economist to empirically investigate the relationship between exchange rate fluctuation and volatility and many other variables of the economy. However, studies on exchange rate volatility and foreign direct investment have arrived at a different conclusion over the past years.

Eshun, Adu, and Buabeng (2019) focusing solely on the private sector investigated the financial determinants of private investment in Ghana, using annual data from the period 1970 to 2016. The ARDL estimation technique was use to investigate the long run and short run relationships between the variables. The empirical results revealed that the exchange rate and interest rate were found to be hostile. The study recommended reducing the rate of interest and also removing all impediment to credit accessibility to promote and sustain domestic private investment in Ghana.

Atoyebi (2019) investigated the determinants of domestic private investment in Nigeria from the period of 1970 to 2018. Using time-series data, the Philp Peron unit test was used to check the stationarity properties of the variables and the OLS estimation technique was employed. The empirical results showed, the interest rate harms private domestic investment, however, credit services had a positive effect because it provides the private sector the needed capital embark on investment that involves huge capital. The study recommended that the Central Bank of Nigeria should use their administrative and monetary power to decrease the borrowing and lending rates.

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Examining the economic determinants of domestic investment, Al Khatib, Altaleb and Alokor (2022) using a time series data, conducted a study on Jordan from the period 1980 to 2020. The ARDL estimation technique was employed to study the long run and short run relationship among the variables. The empirical results revealed that FDI stimulates domestic investment as well as real GDP growth and export of goods and services. Recommendation from the study was that the government should put in measures to attract FDI and encourage the export of goods and services since they all have an encouraging effect on domestic investment.

Insah (2021) investigated the sources of exchange rate volatility in the Ghanaian economy. Using annual data from the period of 1980 to 2020, the ARDL was employed in the study. The empirical results revealed that government expenditure was positively related to exchange rate volatility whiles domestic debts and foreign debts had a negative impact. The study recommended that fiscal and monetary discipline measures should be put in place to check the growth rate of government expenditure to curb the menace of exchange rate volatility.

The work of Oluwaseyi et al. (2022) also investigates the effect of exchange volatility on investment and growth in Nigeria covering the period of 1984 to 2019. The model adopted the VAR in which the vector error correction method, impulse response function and cointegration techniques were employed. The ADF was used to test the stationarity of variables and also to determine the interaction between variables. The Johansen cointegration test revealed the existence of a long run relation between exchange rate, growth interest rate and investment.

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The result showed that exchange rate volatility has an opposite relationship with investment, which supports the findings of Diallo (2018) even though both studies employed different methodology they all recorded a negative relationship between investment and exchange rate volatility. On the other hand, volatility in the rate of exchange has an encouraging effect on inflation and interest rate in Nigeria. The policy recommendation from their studies was that proper exchange rate management structures should be put in place to neutralize volatility of the naira for the better growth of the economy.

Canbaloglu and Gurgun (2017) conducted a panel study for 25 economies on the topic "the impact of exchange rate uncertainty on domestic investment". The GARCH (1,1), EGARCH (1,1) and GJR-GARCH (1, 1) was used to model the exchange rate uncertainty for the countries under study and also the generalized least square estimation technique was used to estimate the impact. The empirical results revealed that the impact exchange rate uncertainty was favourable and statistically significant to domestic investment. This intuition behind these results was that most of the investors were risk lovers or risk indifferent because they are more motivated by the greater profit, they may reap rather the losses the uncertainty may bring.

In addition to the above, Bahmani-Oskooee and Hajilee (2021) analysed the impact of exchange rate uncertainty on domestic investment for 36 countries mainly consisting of advanced and emerging across the world from the period of 1975-2018. The study employed a standard investment model that included interest rate, real output, real exchange rate and the measure of the variability of the exchange rate as a domestic investment determinant. They also used the bounding testing approach for cointegration

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and error-correction modelling, to differentiate the short-run from the long-run effects.

From their findings, real exchange rate volatility had a significant effect on domestic investment in the short run 27 out of the 36 countries that were studied. But exchange rate uncertainty had a positive impact in 14 countries, whiles in 13 countries it decreases investment. This shows that exchange rate uncertainty has a differential impact on different countries depending on the environmental settings and how the economy is structured.

In Ghana, Obeng (2018), conducted an annual time series study covering the period 1983 to 2015. He looked at how volatility in exchange affect export diversification and whether the effect was symmetric and asymmetric. The LARDL and NARDL were used to capture long run and short run effects. The study revealed that volatility in exchange volatility is harmful to export diversification in Ghana, and more importantly, the study confirmed that the effect of exchange rate volatility on domestic investment is asymmetric. The study recommended that the BOG should put in measures and structures to strengthen the value of the local currency.

Specifically targeting one European Nucci and Pozzolo (2019) investigated the relationship between exchange rate fluctuations and the investment decisions and data was taken from processing companies in Italy covering the period 1986-2015 using panel data. The q investment business theory was used to explain why there are several avenues of foreign vulnerability which impact the investment decision of firms. A decline in value of the local currency was found to have an encouraging effect on investment through the sales from the foreign and local market, whiles the

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negative effect was as a result of the increased cost of imported input. However, the intensity of impact is dependent on the firm monopoly power of the industry.

Using the ARDL approach with a time series data Frimpong & Marbuah (2020) examined the determinants of private sector investment in Ghana covering the period from 1970 to 2019. The accelerator model of investment was used as well as other macroeconomic and political variables were incorporated in their investment model. The results showed that real interest rate, external debt, inflation and coefficient of real GDP were significant and positively related to private investment statistically. However, credit to the private sector and public investment were insignificant but had a positive effect of the public investment confirming a possible crowding because generally, government investments seek the welfare of the economy in terms of infrastructure development which produce a conducive environment for the private sector to also invest.

Bahmani-Oskooee and Xi (2022) investigated exchange rate volatility and domestic consumption in Japan. The study uses quarterly data covering the period 1970 to 2018. The volatility measure was generated using a GARCH approach and ARDL estimation technique was employed to investigate the long run and short run effect of exchange rate volatility on domestic consumption. The empirical findings revealed that though income had a positive effect on domestic consumption, exchange rate volatility and interest rate had a negative effect. The paper further recommended that the government should take steps to strengthen the exchange rate and reduce the inflation rate because they could hurt domestic investment.

Aghion, Bacchetta, Ranciere, and Rogoff (2018) examined the impact of real exchange rate variability on factor productivity taking into consideration the role of financial development in developed and underdeveloped countries. The empirical analysis was based on an 83-country data set covering the period 1960-2016. The study showed that for countries with underdeveloped financial structures the impact of exchange rate volatility is negative on growth, whiles financially advanced countries, the impact of exchange rate volatility has no important or noticeable effect on growth. The findings are backed by theory in the sense that firms of less developed countries face a greater risk when it comes to exchange rate variability because they lack the necessary instrument to manage them.

Bahmani-Oskooee and Mohammadain (2016) used the Nonlinear ARDL model to test whether exchange rate changes have a symmetry or asymmetry effect on domestic production. They argued that depreciation of the currency could either have a promote or hurt on domestic produce, however empirical studies on the subject have all presume that the effect of exchange rate changes is symmetric. The study used quarterly data covering the period of 1973 to 2013. The concept of the partial sum process was used to create exchange rate appreciation and depreciation. The result revealed that the LARDL approach of Shin and Greenwood-Nimo (2014) showed that changes in the real effective exchange rate have an asymmetric effect on the Australian dollar both in the long run and short run. Though the appreciation and depreciation affect Australian domestic production, it is only the appreciation effect that transcends in the long run.

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Furthermore, Dixit and Pindyck (2021), use the theory of inertia to demonstrate that most investors are reluctant to invest in unpredictable circumstances. Further elaborating the work of Dixit and Pindyck (2021), Darby et al. (2023) showed that whether a firm will invest or not depends on the opportunity cost of investing in the face of certainty and uncertainty. If the opportunity cost of waiting is disadvantageous than its current value, the firm is likely not to invest but under lower certainty, that particular firm is likely to invest. He argued that hampering exchange rate volatility does not necessarily lead to an increase in investment because sometimes even when exchange rate volatility suppressed investment will still not respond. His findings revealed that exchange rate volatility has a significant negative effect on investment, however, exchange rate stability would rather increase investment in Europe, especially in countries like France, Italy and Germany.

A study on the exchange rate and export performance in the WAMZ countries conducted by Tarswalie et al, (2023), using the estimation technique of Dynamic OLS (DOLS) presented inconclusive results. Specifically, the results showed that for countries like Nigeria, Liberia and Sierra Leone exchange rate volatility negatively affected export volumes. However, Gambia recorded a positive relationship between exchange rate volatility impact on export volume.

Azeez, Kolopo and Ajayi (2022) investigated the effects of exchange volatility on macroeconomic performance in Nigeria from 1986 to 2020. The estimation technique that was employed in the study was OLS and Johansen cointegration estimation technique which was used to test for the long run and

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short run effect respectively. The results showed that in the long run real exchange rate volatility has a positive effect on volatility.

Serven (2022) undertook a study on developing countries on the topic of real exchange rate uncertainty and private investment. Modelling volatility using GARCH, exchange rate uncertainty had a negative relationship with private investment however the impact of exchange rate uncertainty was uniform. The threshold effect revealed that when exchange rate uncertainty must pass some certain limit for its impact to be significant.

Yilkal (2022) investigated how currency devaluation affects output in Ethiopia and in developing economies with currency crises respectively. The study used time series data from 1980 to 2020. According to Yilkal (2022), the study revealed that currency devaluation has a contractionary effect on output in the long run but in the short run the effect is neutral. Devaluation is a major part of the gross domestic product because Ethiopian export is dominated by agricultural products and with devaluation makes export cheaper and competitive.

Chapter Summary

This chapter reviewed the theoretical and empirical literature on the relationship between exchange rate volatility and foreign direct investment in Ghana. Some theories were discussed. Most of the studies reviewed in the literature have shown inconclusive results of the effect of exchange rate volatility on foreign direct investment. The observed differences in these results have somehow, contributed to the knowledge gap in the literature thus justifying a further examination of the effect of exchange rate volatility on foreign direct investment in Ghana.

CHAPTER THREE

RESEARCH METHODS

Introduction

The study's research methodology is presented in this chapter. The methods used to collect data for the analysis are described in this chapter. The research methodology is broken down into research design and approach, study scope, data analysis process, research reliability, validity, and ethical considerations. The chapter also explained why these research methodology elements were chosen.

Research Design

The study used a positivist theory within the context of neoclassical economics to achieve the study's goals. The positivist argued that existence is stable and that it can be observed and described objectively without affecting the phenomenon under investigation (Levine, 1997). As a result, positivist theory allowed researchers to analyze social processes objectively and explain the effect of exchange rate volatility on foreign direct investment in Ghana. More specifically, the positivist theory foresaw the use of quantitative analysis methods, such as those used in this review. The construction of mathematical models to examined the relationship between quantitative measurements is well suited to the positivist theory.

In this analysis, the explanatory design was used. The research investigates the connection between exchange rate volatility and direct investment in Ghana. The explanatory research design is considered to be the most suitable research design for the study due to the study's aim. The study

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sought to analyze the effect of exchange rate volatility on Foreign Direct Investment in Ghana.

Research Approach

The quantitative approach was appropriate for this study, because of the objectives of the study to examine the effect of exchange rate volatility on Foreign Direct Investment in Ghana. The quantitative approach enabled the researcher to put the social world into a structure of causality and nullifies the role of human effect through the use of quantitative instrument such as multivariate statistical analysis in analyzing data as used in this study. The study employed the quantitative approach in analyzing the effect of exchange rate volatility on Foreign Direct Investment in Ghana."

Data and Data Source

Annual data for the period 2000-2021 was used. Data for study, stock market index were obtained from Ghana Stock Exchange website. Inflation rate was extracted from World Data Indicator. Interest rate was obtained from the bank of Ghana website. Exchange rate was from International Financial Statistics data set, 2021. A summary of the data type and sources are given in Table 2.

Table 1: Data Type and Sources

Variable Name	Measure	Expected sign	Source
Exchange Rate	Dollar Cedi Rate	+/-	International Monetary Fund (IMF), International Financial Statistics (IFS) data set, 2022
FDI	Foreign investment as a ratio of GDP	+	International Monetary Fund (IMF)
Inflation	Consumer price index	+	World Bank, world development indicators (World Bank, 2021)
Interest rate	Average Annual Interest Rate	+	Bank of Ghana
GDP	Log of GDP	+	International Monetary Fund (IMF)
Investment Freedom	Investment Freedom	+	Heritage Foundation

Source: Author's Construct (2023)

Model Description

The purpose of the study was to identify the effect of foreign direct investment on exchange rate volatility. The study adopted the equation specified by Obeng and Sakyi (2017).

$$InFDI_t = \beta_0 + \beta_1 EXR_t + \beta_2 INF_t + \beta_3 INT_t + \beta_4 GDP_t + \beta_5 IF_t + \varepsilon_t \text{ -- Eqn 1}$$

Where FDI, INF, INT and EXR represent foreign direct investment, inflation, interest rate and exchange rate. "In" is the natural log operator while "t" shows time-variant. β_1 is expected to be positive and statistically significant since it reflects the coefficient of the explanatory variables. From the model description, the dependent variable was the foreign direct investment. Exchange rate was the independent variables. The model was controlled by Inflation rate, interest rates, gross domestic product and investment freedom.

Estimation Strategy

The estimations begin with an investigation of the stationarity properties of the variables in Equation (1). The parametric augmented Dickey-Fuller (ADF) method by Dickey and Fuller (1979, 1981) and the non-parametric Phillips-Perron (PP) procedure by Phillips and Perron (1988) are used. Examining stationarity is particularly important in order to avoid spurious regressions. These procedures were also relevant for small sample size time series data. In addition, the PP test serves as a robustness check on the ADF test results as it is able to correct for higher level serial correlation as well as heteroscedasticity that may be present in the ADF results. By the tests, the null hypothesis of unit root, hence, non-stationarity is examined against the alternative hypothesis of no unit root, implying stationarity in each method.

The ARDL Cointegration Approach

To search for possible valid dynamic long-run relationships amongst the variables of interest, the study adopts the recently developed autoregressive distributed lags (ARDL). This new version of the cointegration techniques for determining long-run relationships among the variables in this study was developed by Pesaran et al. (2001). There are a number of advantages of using this cointegration approach over other alternatives such as the conventional approach (Johansen, 1998; Johansen and Juselius, 1990).

Firstly, the Johansen conventional cointegration method estimated the long-run relationship under the restrictive assumption that all the model's variables are integrated of order 1, that is I(1). However, and as shown at Pesaran and Shin (1995) and Pesaran et al. (2001), the ARDL models yield consistent estimates of the long run coefficients that are asymptotically normal

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irrespective of whether the underlying regressors are purely $I(0)$, purely $I(1)$, or mixture of both. This implied that, unlike the standard cointegration approach, the ARDL avoids the pre-testing of variables to identify the order of integration of the underlying variables.

Secondly, the ARDL method avoids the larger number of specifications to be made in the standard cointegration test. These include decisions regarding the number of endogenous and exogenous variables (if any) to be included, the treatment of deterministic elements, as well as the optimal of lags to be specified. The estimation procedures are generally very sensitive to the method used to make these choices and decisions (Pesaran and Smith, 1998). With the ARDL methodology, it is possible that different variables have different optimal lags, which is impossible with the conventional cointegration test. Furthermore, the ARDL methodology provides unbiased estimates of the long-run model and valid t-statistics by the inclusion of dynamics in the model, even when some of the regressors are endogenous (Inter, 1993). This is particularly important in this study because of potential endogeneity of some of the regressors (particularly inflation).

Lastly, when compared to other alternative techniques, the ARDL methodology performed better with small sample data which according to Nayaran (2004) should be between 30 and 80 observations like the one in this study.

Test for Stationarity (Unit Root Test)

The aim of this test was to look at the individual variables' stationarity or time series properties. The distribution of the time series variable does not alter over time, which is the exact concept of stationarity. As a result of

stationarity, the future must be similar to the past, at least in a probabilistic context. However, many economic time series are non-stationary in practice, making traditional OLS-based statistical inferences inaccurate. The aim of these stationarity tests is to decide the order of integration of and of the variables in this analysis and, as a result, the number of times each variable must be differenced to achieve stationarity. Furthermore, it is to eliminate the risk of a false regression. To evaluate the order of integration, this research employs a systematic statistical method based on the augmented Dickey Fuller (1979, 1981) test for the existence of unit root.

The ADF test for unit root compares the null hypothesis to the alternative hypothesis. As a result, it compares the null hypothesis of a unit root to the alternative of a stationary sequence.

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ARDL Model Specification

According to Pesaran and Pesaran (1997), there are two steps for implementing the ARDL approach to cointegration procedure. First, the

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existence of the long-run relationship between the variables in the system is tested using an F-test.

Secondly, the error correction representation and long-run model are estimated after the lag orders of the variables are chosen using Akaike Information Criterion (AIC). Then the stability tests, namely Cummulative Sum of Recursive Squares (CUSUM) and Cummulative Sum of Square of Recursive Residuals (CUSUMQ) tests are conducted. To conduct the bounds test approach in examining the relationships, the model should be stated in an unrestricted error correction model (UECM) form as follows:

$$\Delta InFDI_t = \gamma + \sum_{i=1}^{P_1} \alpha_1 \, DInINT_{t-i} + \sum_{i=0}^{P_2} \kappa_1 \, DInINF_{t-i} + \sum_{i=0}^{P_3} \pi_1 \, DEXR_{t-i}$$

$$+ \lambda_1 InFDI_{t-1} + \lambda_2 InINT_{t-1} + \lambda_3 INF_{t-1} + \lambda_4 EXR_{t-1} + \varepsilon_t$$

Granger Causality Tests

The study of causal relationships among economic variables has been one of the main objectives of empirical econometrics. According to Engle and Granger (1987), cointegrated variables must have an error correction representation. "Granger causality" is a term for a specific notion of causality in time series analysis. A variable say X Granger-causes say Y if Y can be explained or predicted using the histories of both X and Y than it can, using the history of Y alone. Grange-causality is thus, a powerful tool, in that it allows one to test for things that one might otherwise assume away or otherwise taken for granted. One of the implications of Granger representation theorem is that if non-stationary series are cointegrated, then one of the series must granger cause the other (Gujarati, 2009). To examine the direction of

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causality in the presence of cointegrating vectors, Granger causality is conducted based on the following:

$$\Delta Y_t = \delta_0 + \Sigma\beta_{1i}p_{i=1}\Delta Y_{t-i} + \Sigma\emptyset_{1i}p_{i=0}\Delta X_{t-i} + \omega_{1i}ECT_{t-1} + u_t$$

$$\Delta X_t = \delta_0 + \Sigma\beta_{2i}p_{i=1}\Delta X_{t-i} + \Sigma\emptyset_{2i}p_{i=0}\Delta Y_{t-i} + \omega_{2i}ECT_{t-1} + v_t$$

Where ΔY and ΔX are the non-stationary dependent and independent variables, ECT is the error correction term, ω_{1i} and ω_{2i} are the speed of adjustments, p is the optimal lag order while the subscripts t and $t\text{-}i$ denote the current and lagged values. If the series are not cointegrated, the error correction terms will not appear in equations above. To find out whether the independent variable (X) granger-causes the dependent variable (Y) in equation, we examined the joint significance of the lagged dynamic term by testing the null hypothesis:

$$H0 = \emptyset_{1i} = 0$$

Implying that the explanatory variable (X) does not granger cause the dependent variable (Y), against the alternative hypothesis that

$$H1 = \emptyset_{1i} \neq 0$$

Implying that the explanatory variable (X) granger causes the dependent variable (Y)

Similarly, to find out whether the independent variable (*Y*) granger-cause the dependent variable (*X*) in equation, we examine the significance of the lagged dynamic term by testing the null hypothesis:

$$H0 = \emptyset_{2i} = 0$$

Implying that the independent variable (Y) does not granger cause the dependent variable (X), against the alternative hypothesis that

$$H1 = \emptyset_{2i} \neq 0$$

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Implying that the explanatory variable (Y) granger causes the dependent variable (X)

Using the standard F-test or Wald statistic, four possibilities exist:

First, rejection of the null hypothesis in equation but failing to reject the null in equation at the same time implies unidirectional causality running from X to Y. Second, a rejection of the null hypothesis in equation but at the same time failing to reject the null in the other equation implies unidirectional causality running from Y to X. Third, simultaneous rejection of the two null hypotheses indicates bi-directional causality. Fourth, simultaneous failure to reject the two null hypotheses indicates independence or no causality between the variables of interest."

Data Analysis

The study employed a quantitative research design approach to investigate and obtain evidence to answer the research questions. The data analysis process was divided into three stages – model identification, model estimation, and model diagnostics. The study started with model identification where it examined the descriptive properties and the distribution of each variable. The study investigated whether the dependent series exhibits seasonality and requires seasonal differencing. Similarly, the researcher examined whether the dependent series is stationary or requires stationary differencing. The next natural step in the model identification stage of a time series analysis is to determine order (that is p, q) of the model.

After model identification, the study estimated the model using the Auto-regression Distributed Lag (ARDL) was used in the estimation since some of the variables stationed at level one and others were stationed at $I(0)$.

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Also, the Granger Causality was used to analyze the causal relationship among the variables. Lastly, the study examined whether the forecasted model is proper or not. To do this, the study investigated whether a plot of the residuals is without any pattern, then the normality of the pattern was examined whether the distribution of the residuals is normally distributed, and the study performed portmanteau tests on the residuals to find out whether they exhibit autocorrelation.

Ethical Issues

The study ensured that all ethical issues in social sciences research such as confidentiality, anonymity and privacy are followed. More so, the data extracted was used for purpose of the research only.

Chapter Summary

This chapter developed and presented the methodological framework suitable for conducting the study. Annual time-series data for the period 2000 to 2021 was used for the study. Stationarity test was conducted using ADF and PP tests. Moreover, ARDL econometric methodology was used to examine the long-run and short-run dynamics among the variables. Also, the study used the granger causality model to examine the causal relationship between the exchange rate volatility and foreign direct investment in Ghana.

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CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

The main objective of the study is to assess the impact of macroeconomic indicators on stock market performance of Ghana Stock Exchange Market in Ghana. This chapter explained the results and discussion based on the three objectives stated. The long run impact, short run impact and the causal effect of the variables in the study.

Descriptive Statistics

The study computed the descriptive statistics of the relevant variables involved in the study. From table 3, the variables have positive average values (means).

Table 2: Descriptive Statistics

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Probability	Observations
FDI	4.924	5.262	9.467	0.956	2.634	0.089	1.882	1.174	0.556	22
EXCHANGE RATE	2.506	1.560	6.150	0.683	1.901	0.736	2.000	2.902	0.234	22
INTEREST RATE	17.068	16.000	25.000	11.500	4.472	0.4514	1.9721	1.716	0.424	22
INFLATION	16.005	12.026	41.510	7.144	9.493	1.737	5.070	14.999	0.000	22
INVESTMENT FREEDOM	59.545	62.500	70.000	50.000	9.247	-0.003	1.161	3.099	0.212	22
LN_GDP_	24.023	24.295	25.075	22.329	0.933	-0.656	1.977	2.539	0.281	22

Source: Field Survey (2023)

It can also be seen from Table 3 that; interest rate recorded an average of 17.068. Interest rate recorded a minimum value of 11.500. Maximum value for interest rate 25.00. Inflation rate recorded an average rate of 16.005%. The minimum value for inflation was 7.144 with a corresponding maximum value

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of 41.510. Exchange rate recorded an average of 2.506. It recorded a maximum value of 6.150 with a corresponding minimum value of 0.683. FDI recorded an average of 4.924 with a corresponding minimum value of 0.956 with a corresponding maximum value of 9.467. Investment freedom recorded an average of 59.545 with a correspondent standard deviation of 9.247. The variable recorded a maximum value of investment freedom 70 with a corresponding minimum value of 50.00. Gross Domestic Product recorded an average of 24.023 with a corresponding standard deviation of 0.933. The maximum value of GDP was 25.075 with a corresponding minimum value of 22.329."

Unit Root Test

The unit root test results for the variables in model are given in Tables 3 and 4. Table 3 contains the ADF unit root test results while Table 4 contains that of PP. Even though the bounds test (ARDL) approach to cointegration does not require the pretesting of the variables for unit roots, it is however important to perform this test to verify that the variables are not integrated of an order higher than one. The purpose is to ascertain the absence or otherwise of $I(2)$ variables to extricate the results from spurious regression. Thus, in order to ensure that some of the variables are not integrated at higher order, there is the need to complement the estimated process with unit root tests.

For this reason, before applying Autoregressive Distributed Lags approach to cointegration and Granger-causality test, unit root tests was conducted in order to investigate the stationarity properties of the data. As a result, the ADF and PP tests were applied to all the variables in levels and in first difference in order to formally establish their order of integration. To be

certain of the order of integration of the variables, the test was conducted with intercept and time trend in the model.

The results of ADF and PP test for unit root with intercept and trend in the model for all the variables are presented in Table 4 and Table 5 respectively. The null hypothesis is that the series is non-stationary, or contains a unit root. The rejection of the null hypothesis is based on the MacKinnon (1996) critical values as well as the probability values.

Table 3: Unit Root Test Results Table (ADF)

UNIT ROOT TEST RESULTS TABLE (ADF)						
Null Hypothesis: the variable has a unit root						
At Level						
		EXCHANGE_RATE	FDI	LN_GDP	INFLATION	INTEREST_RATE	INVESTMENTFREEDOM
With Constant	t-Statistic	2.5766	-1.4545	-1.8092	-3.7003	-2.7343	-1.0119
	Prob.	**0.9999**	**0.5362**	**0.3660**	**0.0121**	**0.0859**	**0.7293**
		n0	n0	n0	**	*	n0
With Constant & Trend	t-Statistic	-1.2171	-1.2987	-1.0404	-1.8268	-2.6500	-2.5042
	Prob.	**0.8802**	**0.8598**	**0.9157**	**0.6514**	**0.2646**	**0.3227**
		n0	n0	n0	n0	n0	n0
Without Constant & Trend	t-Statistic	5.7772	-0.5676	3.3778	-2.2789	-0.5718	0.8310
	Prob.	**1.0000**	**0.4592**	**0.9994**	**0.0251**	**0.4574**	**0.8833**
		n0	n0	n0	**	n0	n0
At First Difference						
		d(EXCHANGE_RATE)	d(FDI)	d(LN_GDP_)	d(INFLATION)	d(INTEREST_RATE)	d(INVESTMENTFREEDOM)
With Constant	t-Statistic	-4.4377	-4.0907	-4.0673	-7.5228	-3.5342	-4.7787
	Prob.	**0.0047**	**0.0055**	**0.0058**	**0.0000**	**0.0200**	**0.0013**
		***	***	***	***	**	***
With Constant & Trend	t-Statistic	-5.1933	-4.2044	-4.2550	-7.9730	-3.6142	-4.6412
	Prob.	**0.0007**	**0.0178**	**0.0205**	**0.0000**	**0.0590**	**0.0075**
		***	**	**	***	*	***
Without Constant & Trend	t-Statistic	-5.4243	-4.1976	-2.8238	-7.3221	-3.7356	-4.6404
	Prob.	**0.0003**	**0.0002**	**0.0072**	**0.0000**	**0.0009**	**0.0001**
		***	***	***	***	***	***

Notes:
b: Lag Length based on SIC
c: Probability based on MacKinnon (1996) one-sided p-values.

Table 4: PP Unit Root

UNIT ROOT TEST RESULTS TABLE (PP)							
Null Hypothesis: the variable has a unit root							
	At Level						
		EXCHANGE_RATE	FDI	LN_GDP_	INFLATION	INTEREST_RATE	INVESTMENTFREEDOM
With Constant	t-Statistic	2.1821	-1.5184	-2.0425	-3.9813	-2.9048	-0.8879
	Prob.	*0.9998*	*0.5050*	*0.2679*	*0.0066*	*0.0616*	*0.7716*
		n0	n0	n0	***	*	n0
With Constant & Trend	t-Statistic	-1.2171	-1.3882	-0.9543	-4.3126	-2.8656	-2.5039
	Prob.	*0.8802*	*0.8342*	*0.9294*	*0.0137*	*0.1920*	*0.3229*
		n0	n0	n0	**	n0	n0
Without Constant & Trend	t-Statistic	4.9906	-0.5886	3.3778	-2.2789	-0.3398	1.5527
	Prob.	*1.0000*	*0.4502*	*0.9994*	*0.0251*	*0.5504*	*0.9657*
		n0	n0	n0	**	n0	n0
	At First Difference						
		d(EXCHANGE_RATE)	d(FDI)	d(LN_GDP_)	d(INFLATION)	d(INTEREST_RATE)	d(INVESTMENTFREEDOM)
With Constant	t-Statistic	-4.4377	-4.0907	-4.0673	-7.7554	-4.8484	-5.3410
	Prob.	*0.0047*	*0.0055*	*0.0058*	*0.0000*	*0.0011*	*0.0004*
		***	***	***	***	***	***
With Constant & Trend	t-Statistic	-5.1556	-4.1990	-5.8113	-8.5168	-4.7217	-5.1293
	Prob.	*0.0002*	*0.0179*	*0.0007*	*0.0000*	*0.0064*	*0.0029*
		***	**	***	***	***	***
Without Constant & Trend	t-Statistic	-6.2824	-4.1976	-2.7583	-7.3443	-4.9940	-4.6676
	Prob.	*0.0003*	*0.0002*	*0.0084*	*0.0000*	*0.0000*	*0.0001*
		***	***	***	***	***	***

Notes:
b: Lag Length based on SIC
c: Probability based on MacKinnon (1996) one-sided p-values.

It is evident from the ADF and PP test results that the variables in Equation (1) are either integrated of order 0 (i.e. $I(0)$) or 1 (i.e. I(1)), irrespective of whether the test is performed with a constant only, constant and trend or with a trend but no constant. Hence, the variables in Equation (1) are a mixture of I(0) and I(1) variables. There was no I(2) integration. Therefore, the ARDL method for examining cointegration becomes appropriate following

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the unit root results obtained. In an autoregression model, it forecast the variable of interest using a linear combination of past values of the variable. This was appropriate for the study due to the effect lag of exchange rate, and stock returns have on the current stock returns. An autoregressive (AR) model predicts future behavior based on past behavior. It's used for forecasting when there is some correlation between values in a time series and the values that precede and succeed them.

Cointegration Analysis

Since the focus of this study was to identify the relationship between exchange rate volatility and foreign direct investment, it is important to test the existence of long-run equilibrium between these variables within the framework of the bounds testing approach to cointegration. Given that the study employed annual data, a lag length of 2 for annual data is used in the bounds test. Pesaran, Shin and Smith (1999) suggest a maximum lag of two for annual data in the bounds testing to cointegration. After the lag length was determined, an F-test for the joint significance of the coefficients of lagged levels of the variables was conducted. Thus, each of the variables in the model is taken as dependent variable and a regression is run on the others. For instance, Return is taken as the dependent variable and it is regressed on the other variables. After that another variable for instance Interest rate is taken as the dependent variable and it is also regressed on the other variables. This action is repeated for all the variables in the model. When this is done the number of estimated regressions would be equal to the variables in the model.

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Pesaran and Pesaran (1997) indicated that "this OLS regression in the first difference is of no direct interest" to the bounds cointegration test. It is however, the F-statistics values of all the regressions when each of the variables is normalized on the other which are of great importance. This F-statistics tests the joint null hypothesis that the coefficients of the lagged levels are zero. In other words, there is no long run relationship between them. The essence of the F-test is to determine the existence or otherwise of cointegration among the variables in the long run. The results of the computed F-statistics when Ret is normalized (that is, considered as dependent variable) in the ARDL-OLS regression are presented in Table 6.

From Table 6, the F-statistics that the joint null hypothesis of lagged level variables (i.e. variable addition test) of the coefficients is zero is rejected at 5% significance level. Further, since the calculated F-statistics for F_{FDI} (.) = 8.2145639 exceeds the upper bound of the critical value of band (2.89), the null hypothesis of no cointegration (i.e. long run relationship) between exchange rate volatility and Foreign Direct Investment in Ghana is rejected.

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Table 5: ARDL Long Run Form and Bounds Test

Dependent Variable: D(FDI)
Selected Model: ARDL(2,3,0,4,4,4,4)

F-Bounds Test			Null Hypothesis: No levels relationship	
Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	8.2145639 ***	10%	1.92	2.89
K	6	5%	2.17	3.21
		2.5%	2.43	3.51
		1%	2.73	3.9
Actual Sample Size	22	Finite Sample: n=30		
		10%	2.099	3.181
		5%	2.457	3.65
		1%	3.282	4.73
		Finite Sample: n=22		
		10%	2.131	3.223
		5%	2.504	3.723
		1%	3.383	4.832

Note: Critical values are obtained from Narayan (2004), ** , ***denotes statistical significance at the 5% level and 1%, K is the number regressors in equations.
Source: Field Survey (2022)

This result indicated that there is a unique cointegration relationship between exchange rate volatility and foreign direct investment in Ghana can be treated as the "long-run forcing" variables. FDI was used as the dependent variable. Therefore, there is existence of cointegration among the variables in the equation and hence it was therefore proceeded with the long run function of stock returns.

Diagnostics of the Bound Test

Diagnostics test were conducted for the ARDL model. Table 7 below shows that test results. Thus, the residuals are normally distributed across observations. Finally, the estimated model passes the test for heteroscedasticity test based on the regression of squared residuals on squared fitted values.

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Table 6: Diagnostics of the Bound Test

Test	Results	Remarks
Normality (Jarque-Bera - 0.65329)	Prob. 0.834695	The model is normally distributed
Functional Form F(1, 22)=0.3664[0.294]		
Serial Correlations	F(7,22) 0.090632 Sig (0.8269)	There is no Serial Correlation
Heteroskedasticity	F(7,22) 0.76123 Sig (0.5612)	Homoskedasticity

Source: Field Survey (2023)

Stability Tests

Pesaran and Pesaran (1997) suggested that the test for the stability for parameters using cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMSQ) plots be conducted after the model is estimated. This is done to eliminate any bias in the results of the estimated model due to unstable parameters. Also, the stability test is appropriate in time series data, especially when one is uncertain about when structural changes might have taken place. The CUSUM and CUSUMSQ statistics are plotted against the critical bound of 5% significance level. According to Bahmani-Oskooee and Nasir (2004), if the plot of these statistics remains within the critical bound of the 5% significance level, the null hypothesis that all coefficients are stable cannot be rejected.

Figure 2 depicted the plot of CUSUM for the estimated ARDL model. The plot suggests the absences of instability of the coefficients since the plots of all coefficients fall within the critical bounds at 5% significance level. Thus, all the coefficients of the estimated model are stable over the period of the study. Figure 3, also depict the plot of CUSUMSQ for the estimated ARDL

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model. The plot also suggests the absences of instability of the coefficients since the plots of all coefficients fall within the critical bounds at 5% significance level. Thus, all the coefficients of the estimated model are stable over the period of the study.
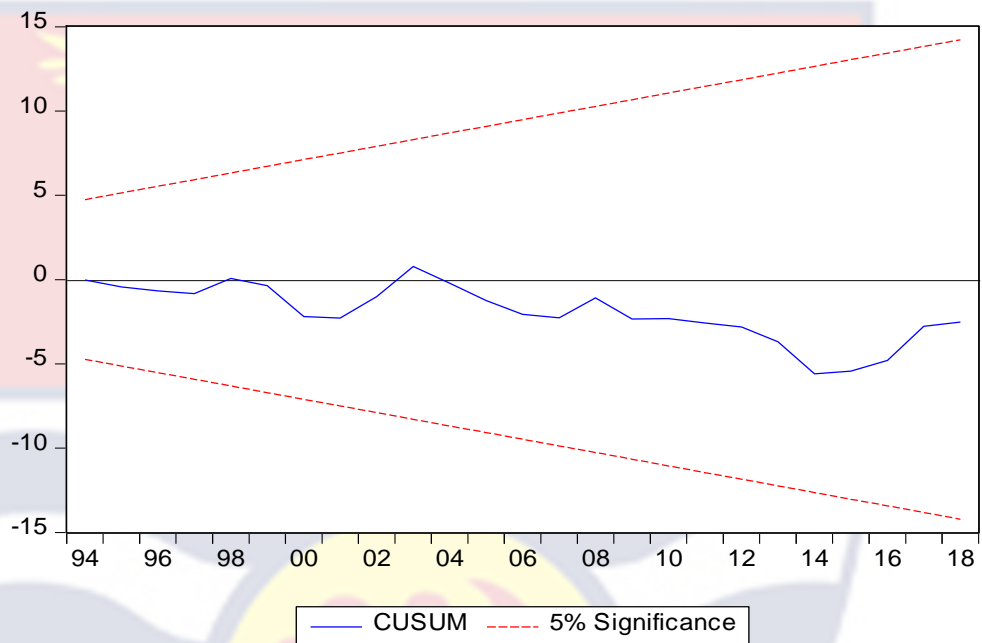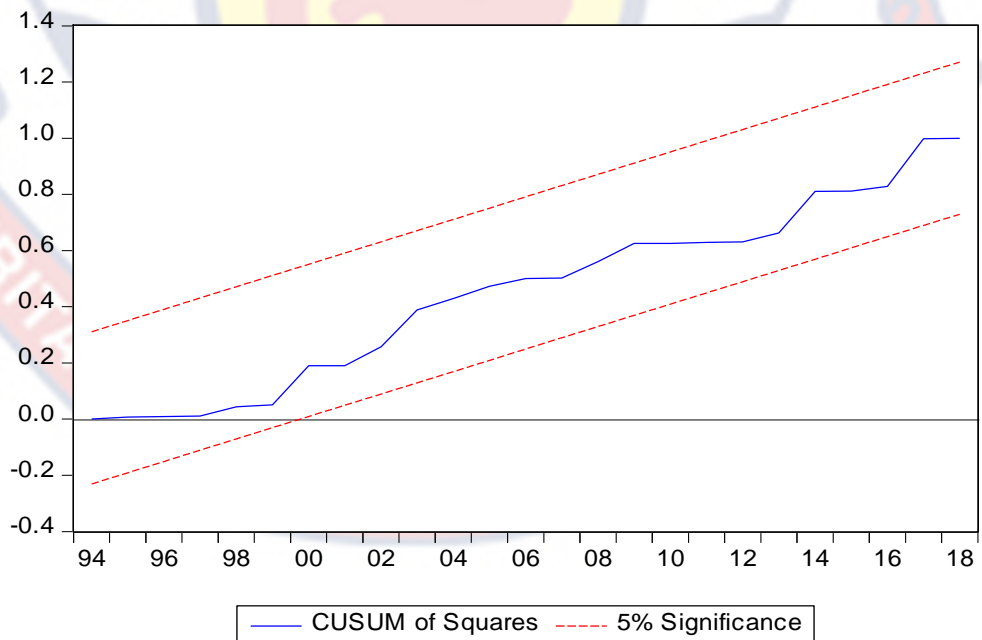

Figure 1: CUSUM stability

Figure 2: CUSUM Stability

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From the diagrams, the blue line in middle of the two lines indicates how fit the model is. The model was there fixed.

Long-term effect of exchange rate volatility on foreign direct investments flows in Ghana

The first objective of the study was to analyzed the long-term effect of foreign direct investments in Ghana. Exchange rate, inflation, interest rate, Gross Domestic Product and Investment Freedom were regressed on returns from Foreign Direct Investment, Ghana.

Table 7: Effect of exchange rate volatility on foreign direct investments in Ghana

	Model 1	Model 2	Model 3
Exchange Rate	.0021158	.0060197	-0.061669***
	(.002671)	(.0039397)	(0.012211)
Inflation	.0020625	.0291836	-0.218170***
	(.0026464)	(.0738919)	(0.014634)
Interest Rate	.0025111	-.0654574	-0.533339***
	(.0026154)	(.0880715)	(0.054813)
Ln GDP			-0.332243
			(0.270619)
Ln Investment			0.046639***
			(0.008198)
GDP		-.0186459	
		(.0200976)	
Investment		.1433271	
		(.4320263)	
Constant	.004487	.9594571 *	1.105213
	(.0047041)	(.5768963)	(0.795790)
Diagnostics			
R-squared	0.0723	0.19821	0.623280
Adjusted R-squared	0.0414	0.17309	0.568150
Durbin Watson Stat	0.9873	1.38768	1.799228
n	22	22	22

Note: This Table shows the long-run estimates of the macroeconomic indicators on stock returns. Ordinary Least Square regression was used. FDI-foreign domestic investment; GDP – Gross Domestic Product; and Investment Freedom were the control variables * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$; Standard errors in parentheses. Model 3 – Model with control Variables and and log of GDP and Log of Investment. Model 2 – model without control variables; model 1 – no log

Table 8 showed the long run relationship between exchange rate volatility and foreign direct investment. Out of the three models stated, Model

3 was appropriate since its R-square and the Durbin Watson was within the appropriate range. Also, the control variables were logged because they were not normally distributed.

The results show a negative and significant relationship between exchange rate volatility and foreign direct investment [B= -0.061669; t(22) = -5.050213; p<0.05]. A unit increase in exchange rate volatility will lead a 0.061669 decrease in the foreign direct investment. The findings therefore confirm with studies by Akbar et al. (2019) who found that exchange rate influences foreign direct investment negatively. Exchange rate volatility creates uncertainty and risk for foreign investors. When the value of a foreign currency fluctuates significantly, investors may find it challenging to predict their future returns and plan their investments effectively. This uncertainty can deter potential investors from committing to long-term FDI projects. Exchange rate fluctuations can lead to unexpected gains or losses for foreign investors. If the value of the local currency in which the FDI is made depreciates significantly against the investor's home currency, it can erode the profitability of the investment. Investors may be hesitant to invest if they fear that currency movements will negatively impact their returns. Frequent currency fluctuations can increase transaction costs associated with FDI. Companies may need to spend more on currency hedging strategies to mitigate exchange rate risk. These additional costs can reduce the attractiveness of FDI opportunities. Exchange rate volatility can make it difficult to forecast future cash flows accurately. This can pose challenges when assessing the feasibility and potential returns of FDI projects. Uncertainty about future exchange rates can lead to incorrect investment decisions. High exchange rate volatility may

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encourage investors to adopt a short-term perspective rather than committing to long-term FDI projects. They may prefer to engage in speculative activities, such as currency trading, rather than making long-term investments with uncertain returns. Also, in situations where exchange rate volatility is extreme and the local currency experiences sharp depreciations, foreign investors may become concerned about the stability of their investments. This can lead to capital flight, where investors withdraw their funds from the country, potentially causing economic instability. Prolonged or extreme exchange rate volatility can erode investor confidence in a country's economic policies and stability. This loss of confidence can deter FDI, as investors seek more stable and predictable environments for their investments.

There was a negative relationship between inflation and foreign direct investment [B=-0.218170; t(22) = -14.91149; p<0.05]. In the long run, a unit increase in inflation would lead to a 0.218170 decrease in foreign direct investment at 1% statistically significant level. Inflation erodes the purchasing power of money over time. When a host country experiences high inflation, the real returns on FDI may be lower than anticipated. Foreign investors may find that their returns do not keep pace with the rising cost of living and doing business in that country, making the investment less attractive. High inflation can lead to increased operating costs for businesses in the host country. This includes higher wages, prices for raw materials, and other production inputs. These rising costs can reduce the profitability of FDI projects, potentially discouraging foreign investors. Inflation can introduce uncertainty into the business environment. Rapid or unpredictable changes in prices can make it difficult for investors to plan and forecast accurately. This uncertainty can

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deter FDI, especially for long-term projects that require stable economic conditions. Inflation can put pressure on a country's exchange rate, leading to currency depreciation. When a host country's currency loses value due to inflation, it can affect the returns on FDI for foreign investors when they convert their profits back into their home currency. This exchange rate risk can make FDI less attractive.

The results show a negative relationship between interest rate and foreign direct investment [B= -0.53339; t(22) = -9.730155; p<0.05]. A unit increase in interest rate would lead to a 0.5339 decrease in foreign direct investment at 1% statistically significant level. The results are in line with several documented papers on the effect of interest rate on foreign direct investment (Ayub and Masih, 2013; Alam & Uddin, 2009). High interest rates mean that borrowing money for FDI projects becomes more expensive. This increased cost of capital can make FDI projects less financially viable and reduce their attractiveness to investors. It may deter businesses from pursuing FDI opportunities that require significant financing. High interest rates can eat into the profits generated by FDI projects. If a company has to pay substantial interest expenses on loans used to finance its foreign investments, it may see reduced profitability, making the investment less appealing. High interest rates can lead to reduced investment spending overall, as companies may prioritize servicing existing debt or avoiding new borrowing due to the higher costs. This reduction in investment spending can limit the flow of FDI into a host country. In environments with high interest rates, there is an increased risk of default on loans used to finance FDI projects. If companies are unable to

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generate sufficient cash flows to cover their debt obligations, it can lead to financial distress and even bankruptcy, putting the entire FDI project at risk.

There was no significant effect between Gross Domestic Product and foreign direct investment [B= 0.332243; t(22) = 1.227715; p>0.05]. The effect between GDP and foreign direct investment was insignificant. That is, irrespective of the gross domestic product, foreign direct investment would not be affected. Similar result was recorded by Malevergne, Pisarenko and Sornette (2006). They found that there was no effect between Gross Domestic Product and foreign direct investment in the long run."

Finally, investment freedom recorded a positive and significant effect on foreign direct investment [B= 0.046639; t(22) = 5.688917; p<0.05]. A unit increase in investment freedom would lead to a positive increase in foreign direct investment. Investment freedom explains the flow of investment capital and the restrictions in investment within a particular period. From the results, it was found that countries with high investment freedom are likely to improve their foreign direct investment.

Diagnostic test for long run model

Table 9 reports the results of the diagnostic test for the estimated model. From the table, the results show that the estimated model passes the Langrangean multiplier test of residual serial correlation, functional form of specification, Normality based on the skewness and Kurtosis of the residuals and heteroscedasticity test based on the regression of squared residuals on fitted values.

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Table 8: Diagnostic Test for Long Run Model

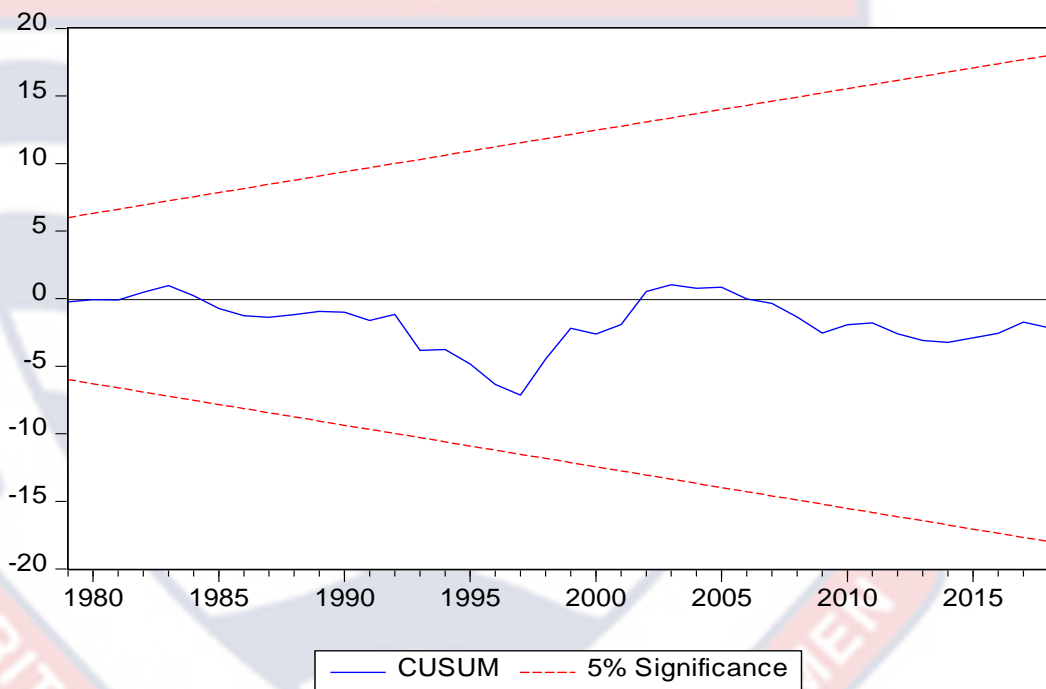| Test	Results	Remarks
Normality (Jarque-Bera, 0.87713)	Prob. 0.9872	The model is normally distributed
Functional Form	F(7,22)=2.5667 [0.225645]	Model stable
Serial Correlations	F(2,23) 0.062424 Sig (0.87652)	There is no Serial Correlation
Heteroskedasticity	F(20,25) 0.57891 Sig (0.76613)	Homoskedasticity

Figure 3: CUSUM for Long Test

From the figure 5 and table 9, the model for long run analysis and fit

and stable since the blue line is between the two red lines.

Short Run Analysis

The second objective of the study was to analyze the short-term effect of exchange rate volatility on foreign direct investment of Ghana. Table 9 shows the result from the ARDL.

Some descriptive statistics can be obtained from Table 9. From the Table, it can be observed that the adjusted R^2 is approximately 0.602016. It can therefore be explained that approximately 60.2% of the variations foreign direct investment is explained by the independent variables. Also, a DW-statistics of approximately 1.911 reveals that there is no autocorrelation in the residuals.

The results also showed that the coefficient of the lagged error correction term ECT (-1) exhibits the expected negative sign (-0.874021) and is statistically significant at 1%. This indicates that approximately 87.4% of the disequilibrium caused by previous years' shocks converges back to the long run equilibrium in the current year. According to Kremers, Ericsson, and Dolado (1992) and Bahmani-Oskooee (2001), a relatively more efficient way of establishing cointegration is through the error correction term. Thus, the study discerns that the variables in the model show evidence of moderate response to equilibrium when shocked or disturbed in the short-run.

Theoretically, it is debated that an error correction mechanism exists whenever there is a cointegrating relationship among two or more variables. The error correction term is thus obtained from the negative and significant lagged residual of the cointegration regression. The ECM stands for the rate of adjustment to restore equilibrium in the dynamic model following a disturbance. The negative coefficient is an indication that any shock that takes

place in the short-run will be corrected in the long-run. The rule of thumb is

that, the larger the error correction coefficient (in absolute terms), the faster

the variables equilibrate in the long-run when shocked (Acheampong, 2007).

Table 9: Short Run Test

Variables	Model 1	Model 2	Model 3
D(RETURNS(-1))	-0.007440	-0.0003421	2.007452***
	(0.014975)	(.0002968)	(0.402402)
D(INFLATION)	-0.472116	0.2871124	-0.097512
	(0.356457)	(.2503592)	(0.160710)
D(INTEREST_RATE)	-0.003375	0.0288957	0.029608
	(0.016857)	(.0783402)	(0.162870)
D(EXCHANGE_RATE)	0.033667	0.0012884	-0.086126*
	(0.014947)	(.0041858)	(0.048639)
D(EXCHANGE_RATE(-1))	0.014576	-1.193289**	-0.219393***
	(0.022944)	(.5816368)	(0.047720)
D(FDI)		-0.0072023	-0.433691
		(.006444)	(0.635247)
D(FDI(-1))		0.0023478	-1.212819
		(.0227697)	(0.676943)
D(LN_GDP_)			0.200218*
			(0.466853)
D(LN_INVESTMENT_)			0.052665***
			(0.010866)
D(GDP_)		-.0163079	
		(.0205841)	
D(INVESTMENT_)		-.0006679**	
		(.0002924)	
CointEq(-1)*		.2267608*	-0.874021***
		(.1220339)	(0.105028)
Constant	4.013849***	0.3579492	-0.003548
	(1.113033)	(.4485788)	0.049299
Diagnostics			
R-squared	0.3212	0.56921	0.810484
Adjusted R-squared	0.2877	0.50982	0.602016
Durbin-Watson stat	1.1259	1.4422	1.911087
N	22	22	22

The lag of the variables were determined by AIC. The ARDL was used in the analysis.D-change or difference, LN- log, GDP- gross domestic product; FDI-foreign direct investment; (-1) -lag 1, (-2) – lag 2, (-3) – lag 3, (-4) – lag 4 D(LN_INVESTMENT(-1) – Difference of Investment Freedom; D(EXCHANGE_RATE (-1)) - Difference of exchange rate of lag 1. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$; Standard errors in parentheses. Model 3 – Model with control Variables and and log of GDP and Log of Investment. Model 2 – model without control variables; model 1 – no log

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From Table 9, out of the three models presented, model 3 had the best diagnostics among the three models. Also, the control variables were logged because they were not normally distributed. Table 9 reported the short run dynamic coefficients of the estimated ARDL model. Lag one of the dependent variable was significant at 1% significance level [B= 2.007452; t(22) = 4.988680; p<0.01]. There was a positive relationship between the lag 2 of foreign direct investment and current foreign direct investment. Current foreign direct investment would increase by 2.007452 in the short run if the previous two period's foreign direct investment increases.

"Inflation recorded an insignificant effect on foreign direct investment in the short run [B= - 0.097512; t(22) = -0.606761; p>0.10]. That is, in the short run, even though inflation would record a negative effect, foreign direct investment's movement is insignificant to the movement of the inflation rate.

"Similarly, interest rate also had insignificant effect on foreign direct investment [B= 0.029608; t(22) = 0.181788; p>0.10]. In the short run, interest rate had an insignificant effect on foreign direct investment. That is, in the short run, changes in the interest rate would not influence foreign direct investment. The effect was positive but insignificant. When interest rate increases, in the short run, firms would not get access to capitals which might affect the foreign investors investing in the country.

With respect to exchange rate, there was a negative and significant effect between current exchange rate and current stock returns in the short run [B= -0.086126; t(22) = -1.770714; p<0.10]. A unit increase in current exchange rate would lead to a 0.086126 decrement in foreign direct investment. As soon as the exchange rate increases, investors would withdraw

their investment from stocks into currency. This will cause the foreign direct investment to record a negative effect. Lag one (1) of exchange rate also recorded a negative and significant effect on foreign direct investment [B= -0.219393; t(22) = -4.597477; p<0.05].

Current investment freedom had a positive and significant influence on foreign direct investment [B= 0.052665; t(22) =4.846529; p<0.05]. A unit increases in current investment freedom would lead to a 0.052665 increase in foreign direct investment in short run.

Diagnostics for Short-Run Analysis

̈The paper examined the adequacy and reliability of the ARDL model by considering their statistical properties. The results are given in Table 10. The paper examined serial correlation using Breusch-Godfrey LM test, heteroscedasticity using the Breusch-Pagan- Godfrey, functional form using the Ramsey Reset Test, and normality using Jarque-Berra test. The results show the model passes all these diagnostic and reliability tests. Further, model stability tests performed using the CUSUM and CUSUMSQ statistic indicates the model is stable over the period considered (see Figure 6 and Figure 7).

Table 10: Diagnostics Test for Short Run Model

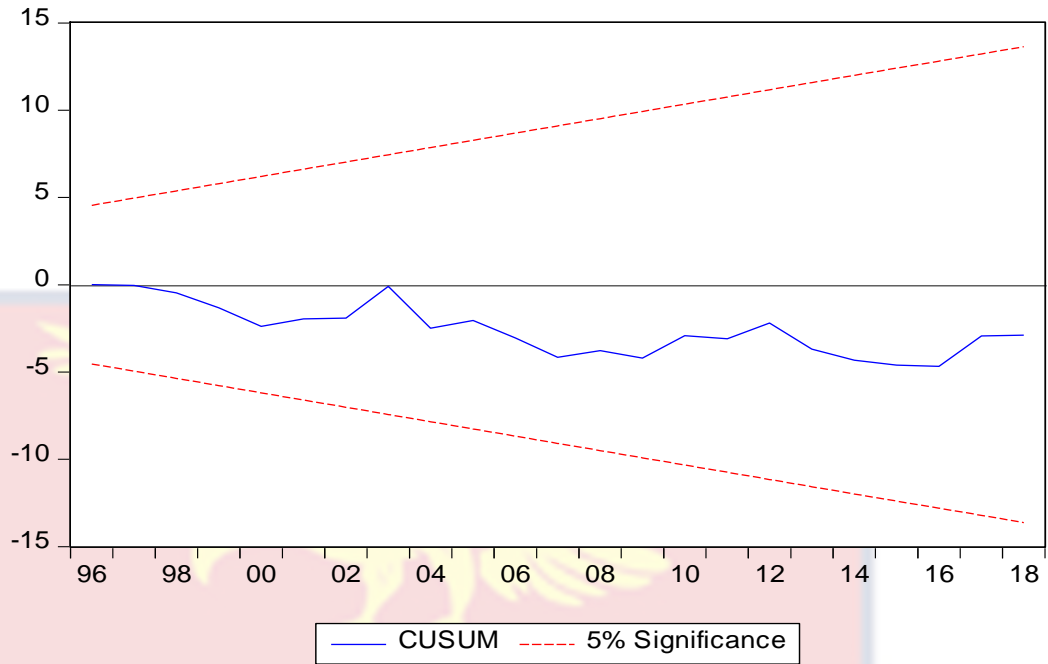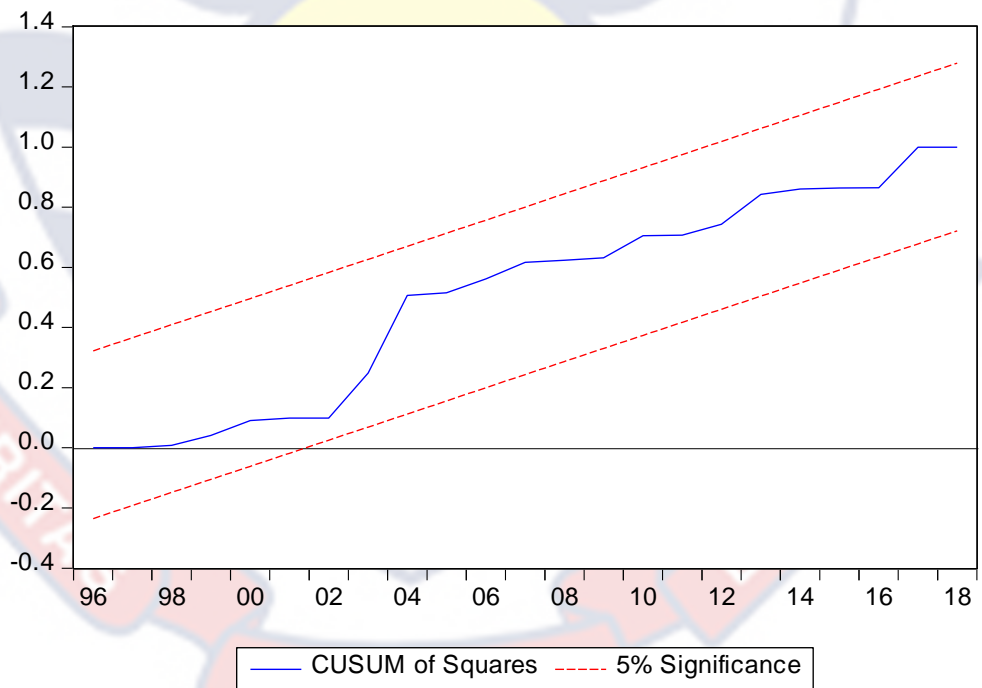| Test	Results	Remarks
Normality (Jarque-Bera, 1.590959)	Prob. 0.451365	The model is normally distributed
Functional Form	F(1,22)=4.084415 [0.0556]	Model stable at 5% level.
Serial Correlations	F(2,21) 2.792752 Sig (0.0840)	There is no Serial Correlation
Heteroskedasticity	F(21,23) 0.557301 Sig (0.9087)	Homoskedasticity

Figure 4: CUSUM Stability test

Figure 5: CUSUM of Squares Stability Test

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Causal Relationship

The third objective of the study was to test the causal relationship between the exchange rate volatility and foreign direct investment. The Granger Causality test was used to achieve this objective.

"In order to examine the predictability of exchange rate on foreign direct investment, Granger causality test was applied to measure the linear causation among the variables. Employing the Pairwise granger causality test attributed to Engel and Granger (1987), the following results were obtained as depicted in Table 12. In testing for causality between variables, the following outcomes can be expected: a test concludes that a variable Granger causes the other when the set of coefficients for the two variables are statistically significant."

Table 11: Granger Causal Effect Table

Null Hypothesis:	Obs	F-Statistic	Prob.
INFLATION does not Granger Cause FDI	47	1.09601	0.3436
FDI does not Granger Cause INFLATION		2.77161	0.0740
INTEREST_RATE does not Granger Cause FDI	46	0.95989	0.3914
FDI does not Granger Cause INTEREST_RATE		9.13094	0.0006
EXCHANGE_RATE does not Granger Cause FDI	46	1.48001	0.2395
FDI does not Granger Cause EXCHANGE_RATE		6.02600	0.0051

Thus, causality can be assumed to move from one variable to the other. On the other hand, a test concludes that a variable does not Granger cause the other, when the set of coefficients on the variables are not statistically significant. Table 12 reports the results for the Granger causality between the variable of interest in the study.

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From the Table 12, the null hypothesis that foreign direct investment does not Granger cause inflation is rejected at 10% significance level meaning that the lag values or histories of inflation together with that of other macroeconomic variables can help in explaining or predict variations in foreign direct investment, than it can using only lag values or histories of inflation. However, the other way round Granger causality is not rejected implying that the lag values of inflation together with the lag values of the other macroeconomic variables under the study do not predict variations in foreign direct investment. The results suggest a unidirectional causality from foreign direct investment to inflation.

From the Table 12, the null hypothesis that foreign direct investment does not Granger cause interest rate is rejected at 5% significance level meaning that the lag values or histories of foreign direct investment together with that of other macroeconomic variables can help in explaining or predict variations in interest rate, than it can using only lag values or histories of interest rate. However, the other way round Granger causality is not rejected implying that the lag values of exchange rate together with the lag values of the other macroeconomic variables under the study do not predict variations in foreign direct investment. The results suggest a unidirectional causality from stock returns to exchange rate.

From the Table, the null hypothesis that foreign direct investment does not Granger cause exchange rate is rejected at 1% significance level, meaning that the lag values or histories of foreign direct investment together with that of other macroeconomic variables can help in explaining or predict variations in exchange rate, than it can using only lag values or histories of exchange

rate. However, the other way round Granger causality is not rejected implying that the lag values of exchange rate under the study do not predict variations in returns. The results suggest a unidirectional causality from stock returns to inflation. These results confirm with Alzoubi (2021). Their study also found that foreign direct investment granger causes some macroeconomic indicators such as the GDP, exchange rate and interest spread. However, this contradicts with studies by Hassan et al., (2015).

Chapter Summary

This chapter analyzed the objectives of the study. The study sought to analyze the effect of exchange rate volatility on foreign direct investment. Three specific objectives were set. These objectives included long run and short run effect of exchange rate volatility on foreign direct investment. The chapter begun with the descriptive statistics of the variables. The unit roots test was analyzed. Also, the cointegration analysis was performance. The long run and short run analysis were established. Finally, the granger causality was employed to analyze the causal effect of exchange rate volatility on foreign direct investment.

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CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATION

Introduction

This happened to be the study's final chapter. The summary of the findings, conclusions and policy implications and recommendations are discussed in this chapter. For further study, the chapter also includes suggestions.

Summary

The study analyzed the effect of exchange rate volatility on foreign direct investment of Ghana. In order to achieve the purpose of the study, three objectives were stated. The first objective was to analyze the long run impact of exchange rate volatility on foreign direct investment of Ghana. The second objective of the study was to analyze the short run impact of exchange rate volatility on foreign direct investment of Ghana. Thirdly, the study objective was analyze the causal relationship between exchange rate volatility and foreign direct investment of Ghana.

The study is centered on two basic theories. These includes the keynesian theory of investment and Endogenous Growth Theory (EGT). Control variables including Gross Domestic Product, interest rate, inflation rate and Investment Freedom. The annual data for exchange rate, interest rate, inflation, FDI, GDP and investment freedom were downloaded from WDI, IMF databank and GSE websites. Secondary data from 2000 to 2021 were employed. Unit root test was run to analyze the stationarity of the variables. It was concluded that, none of the variables were stationed at $I(2)$. In view of that, ARDL was appropriate for the study. The Granger causality test was also

used to analyze the causal relationship between exchange rate volatility and foreign direct investment.

The study found that exchange rate inflation, and interest rate had a negative long run effect on foreign direct investment. Inflation had a 0.218170 decrement in foreign direct investment. Interest rate also had a 0.5333 decrement in foreign direct investment. Exchange rate had a 0.061669 decrease in foreign direct investment. Investment freedom and FDI also had a positive and significant on foreign direct investment (magnitude of 0.0466 and 0.08865 respectively). GDP had no significant effect on foreign direct investment. In the short run, lag 1 of stock return was positive and significant on current foreign direct investment. Current inflation and interest rate had insignificant effect on foreign direct investment. Exchange rate had a negative and significant effect on foreign direct investment.

Finally, the study found that there was a unidirectional causal relationship between foreign direct investment and interest rate, inflation and exchange rate.

Conclusion

The study concluded that interest rates, inflation rate and exchange rate have a significant and negative effect on foreign direct investment. When interest rates increase, firms would not be able to acquire capital which would slow the firm's growth. Higher exchange rates also cause investors to invest in currencies. This reduces foreign direct investment which affects the economy. Inflation also affects the foreign direct investment in the long. Also, Exchange rate had a short run effect on foreign direct investment.

Recommendations

The study made the following recommendation;

The inflation rate plays an important role in determining the foreign direct investment in Ghana. The central bank should endeavor to reduce the inflation rate as a way of promoting economic growth and foreign direct investment. High inflation rate erodes investments especially real interest rates. Government policy makers should develop strategies for attaining optimum levels of broad money growth which do not encourage undesirable consequences like inflation. The Central Bank should continue to reduce the interest rates charged on loans as this has a significant effect on market returns. Government policy makers should develop policies that manage the interest rates at acceptable levels that encourage borrowing for private investments. This should be attained through legislation and availing cheaper sources of deposits for lenders.

Suggestions for Future Studies

Research on the long-term connection between exchange rate volatility and foreign direct investment in Ghana and Africa may be carried out using the VAR or the VECM, among other methods.

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