

UNIVERSITY OF EDUCATION, WINNEBA

**EXCHANGE RATE VOLATILITY, EASE OF DOING BUSINESS AND FDI
FLOWS IN THE ECONOMIC COMMUNITY OF WEST AFRICAN STATES**



MASTER OF BUSINESS ADMINISTRATION

UNIVERSITY OF EDUCATION, WINNEBA

**EXCHANGE RATE VOLATILITY, EASE OF DOING BUSINESS AND FDI
FLOWS IN THE ECONOMIC COMMUNITY OF WEST AFRICAN STATES**



**A Dissertation in the Department of Applied Finance and Policy
Management, School of Business, submitted to the School of
Graduate Studies, in partial fulfilment of the**

**requirements for award of the degree of
Master of Business Administration
(Finance)
in the University of Education, Winneba**

DECEMBER, 2022

DECLARATION

Student's Declaration

I, **Eric Biney**, declare that this work except quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my original work, and it has not been submitted either in part or whole for another degree anywhere.

SIGNATURE:

DATE: 23RD DECEMBER, 2022



Supervisor's Declaration

I, hereby declare that the preparation and presentation of this work were supervised by the guidelines for the supervision of dissertations as laid down by the University of Education, Winneba.

DR. JOSEPH ATO FORSON (SUPERVISOR)

SIGNATURE:

DATE: 23RD DECEMBER, 2022

DEDICATION

To my parents Mr. Frank Biney and Madam Mary Doku and loved ones whose support has taken us through this work successfully.



ACKNOWLEDGEMENTS

I acknowledge and express my gratitude to my supervisor; Dr. Joseph Ato Forson, for the academic guidance he accorded me in every stage of this research project. The wealth of knowledge in academic writing acquired through this interaction is invaluable. I also want to thank my good friends Mr. Emmanuel Bosomtwe, Mr. John Awortwe and Miss Nancy Boadu. As friends they made this happen while providing constructive feedback. Finally, to my family for their continuous encouragement and support without which I would not have been able to concentrate and complete this research Thanks you.



TABLE OF CONTENTS

Content	Page
DECLARATION	iii
DEDICATION	iv
ACKNOWLEDGEMENTS	v
TABLE OF CONTENTS	vi
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF ABBREVIATION	xi
ABSTRACT	xii
CHAPTER ONE: INTRODUCTION	1
1.0 Background of the Study	1
1.1 Statement of the Problem	4
1.2 Objective of the Study	5
1.3 Research Question	5
1.4 Significance of the Study	5
1.5 Limitation of the Study	6
1.6 Organization of the Study	6
CHAPTER TWO: LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK	8
2.0 Introduction	8
2.1 Theoretical Review	8
2.1.1 Theory of asymmetric information	8
2.1.2 The liquidity and economic runs theory	9

2.1.3 Portfolio equilibrium approach of capital flows	10
2.1.3 Institutional FDI Fitness theory	10
2.2 Empirical Review	11
2.3 Conceptual Review	20
2.4 Hypothesis Development	23
CHAPTER THREE: RESEARCH METHODOLOGY	25
3.0 Introduction	25
3.1 Research Design	25
3.2 Population	25
3.3 Sample	26
3.4 Data Collection	26
3.5 Data Analysis and Model Specification	26
3.6 Variable Measurement	28
3.6.1 Ease of Doing Business	28
3.6.2 Inflation	29
3.6.3 Gross Domestic Product (GDP)	29
3.6.4 Corporate Tax	29
3.6.5 Foreign Exchange Rate	29
3.6.6 Foreign direct Investment	30
3.7 Ethical Consideration	30
CHAPTER FOUR: RESULT AND DISCUSSION	31
4.0 Introduction	31
4.1 Descriptive	31
4.2 Correlation	32
4.3 Diagnostics	33



4.3.1 Normality test	33
4.3.2 Heteroskedasticity	34
4.3.3 Cointegration Test	34
4.4 Discussion of Findings	36
4.4.1 Causality between FDI and independent variables	36
4.4.2 Effect of Exchange Movement (EXRM) on Foreign Direct Investment (FDI)	40
4.4.3 Effect of ease of doing business on foreign direct investment flows	42
4.4.4 Effect of FDI on EXRM	48
CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION	55
5.0 Introduction	55
5.1 Summary of Findings	56
5.1. 1 Effect of exchange rate movement on foreign direct Investment	56
5.1.2 Relationship between ease of doing business and foreign direct investment	56
5.1.3 Effect of foreign direct investment flows on exchange rate movement.	56
5.2 Conclusion	57
5.3 Recommendation	58
5.4 Recommendation for further studies	58
REFERENCE	60
APPENDIX A: Data Extract from World Bank Development Indicators	64

LIST OF TABLES

Table	Page
1: Descriptive Statistics	32
2: Correlation Matrix	33
3: Panel Period Heteroskedasticity LR Test	34
4: Panel Cointegration Test	35
5: Toda and Yamamoto augmented Granger Causality Test	35
6: Effect of LEXRM on FDI (Random effect estimation)	50
7: Correlated Random Effects - Hausman Test	51
8: Effect of EXRM on FDI (Fixed effect estimation)	51
9: Effect of Ease of Doing Business on FDI (Random effect estimation)	52
10: Correlated Random Effects - Hausman Test	52
11: Effect of Ease of Doing Business on FDI (Fixed effect estimation)	53
12: Effect of FDI on LEXRM (random effect estimation)	53
13: Correlated Random Effects - Hausman Test	54
14: Effect of FDI on LEXRM (fixed effect estimation)	54

LIST OF FIGURES

Figure	Page
1: Conceptual Framework	22



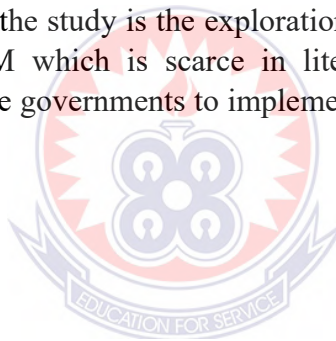
LIST OF ABBREVIATION

ADF	:	Augmented Dickey Fuller
ARDL	:	Autoregressive Distributed Lag
CT	:	Corporate Tax
ECOWAS	:	Economic Organization of West African States
EODB	:	Ease of Doing Business
FDI	:	Foreign Direct Investment
IF	:	Inflation
IMF	:	International Monetary Fund
LEXRM	:	Log of Exchange Rate Movement
LFDI	:	Log of Foreign Direct Investment
LGDP	:	Log of Gross Domestic Product
OECD	:	Organization of Economic Cooperation for Development
PP	:	Phillip Perron



ABSTRACT

The study sought to investigate the effect of exchange rate movement on foreign direct investment into the Economic Organization of West Africa States; to find the relationship between ease of doing business and FDI flows as well as to examine the effect of foreign direct investment on exchange rate movement. The study used casual research design, quantitative approach, census sampling technique that considered the 15 countries in the jurisdiction, annual data period spanned from 2010 through 2021. panel pooled cointegration, Pearson product moment correlation were deployed to check appropriateness of the data. Through the Toda and Yamamoto augmented granger causality test, the study observed that a uni-causality exist from EXRM to FDI and from EODB to FDI. Multivariate regression test through Engle Granger Least Square random effect and panel least square fixed effect estimations were deployed. The result revealed that contrary to the harbored notion in academia, exchange rate has significant negative effect on FDI with random estimation yet insignificant for fixed effect estimation. Notwithstanding, ease of doing business has positive relationship with FDI for both estimations. Also, the study found that FDI flows inversely impact exchange rate in both random and fixed effect estimations. The findings contribute to the existing understanding on the nexus between the discussed variables. The novelty of the study is the exploration of the bi-directional relationship between FDI and EXRM which is scarce in literature on ECOWAS. The study recommends member state governments to implement pragmatic economic policies in order to check FDI flows.



CHAPTER ONE

INTRODUCTION

1.0 Background of the Study

This chapter focused on background to the study, problem statement, research objectives, questions of the study, significance of the study and structure of the study.

The exchange rate is a key macroeconomic factor that affects international trade and the real economy of each country. The development of international trade creates conditions where volatility comes with the exchange rate (Morina & Hysa, 2020).

According to Khan and Hussain (2012) the exchange rate is one of the most significant aspects in an open economy because it directly affects macroeconomic variables like Foreign Direct Investment (FDI) and Gross Domestic Product (GDP). Economics, policy maker and investor attention are drawn to the exchange rate of country, and then deposit their funds their cantered nation. They had assumed that there would be an Exchange rate gives advantages for competition in trading internationally. by raising a country's exchange rate Domestic exports become more affordable, and it also boosts the demand for exports, which indicates global Imports will decline and product demand will rise. It affects FDI, and all of these factors ultimately have an impact on GDP of the nation.

Exchange rate refers to how the unit of domestic currency can be change with the other nations currency unit (Javed & Farooq, 2009). Simply it is change of one country currency into the other country currency. The demand and supply of currency actually are the main element of exchange rate instability. Exchange rate instability directly affects the decision makers to decide that how much import and export is favourably. It also tells that how much things should be manufactured, import, export,

money taken reserve and balance of payment. Exchange rate also impacts on the prices of export, import and balance of payment. Exchange rate works as a great opportunity for domestic investor to earn high profit by investing in foreign currency. The investors and traders like that system where there is very small inconsistency difference, between actual and expected value of exchange rate. The instability in exchange rate is source of higher profit; it is the perception of one school of thought.

Consistent changing exchange rates affect the cost of foreign direct investment (FDI) in international assets. Foreign investors would be prudent to evaluate multiple factors when they make FDI decisions. Similar issue affects Multi-National Companies. These factors include, but are not limited to trade policies, interest rates, taxes, country credit ratings, and other economic issues such as repatriation of earnings and exchange rates. Currency risks such as sovereign financial debt and austerity measures in countries, and exchange rate fluctuations i.e., weaker dollars, higher or lower euros have been on the forefront of economic discussions for several years. Currency strengthening plays a role, as companies tend to invest when the domestic currency is stronger. Likewise, companies import more goods or services in other countries when the currency is weaker. Thus, exchange rate structural breaks can potentially affect FDI decisions. The inflows of foreign direct investment (FDI) are important for a country's economic development, but the world market for FDI has become more competitive (Lily et al.,2014).

Since the early 1980s, foreign direct investment (FDI) has been an international flow of capital that provides a parent company or multinational enterprises (MNEs) with control over foreign affiliates. FDI is increasingly recognized as an important instrument for resource to flow across national borders to improve economic

performance, industrial and international competitiveness, and exports. FDI is a part of a nation's national financial accounting. Foreign assets are purchased with direct foreign investment into domestic organizations, tools, and structures. It is exempt from investment from abroad in the stock market. Direct foreign Investment is seen to be more beneficial to a nation than investments in its companies' stock because stock Investments may be "hot money," which could depart at the first indication of danger, while FDI is long-lasting and typically useful whether or not things go well. Furthermore, other considerations such as market size, tax benefits, political stability and the freedom of the economic activity are believed to attract FDI into a country. Conventional wisdom suggests that the knowledge of the causal relationship between exchange rates and FDI has significant implications, especially, from the viewpoint of recent large cross-border movement of funds and investments. Therefore, it is important to research the real impact of exchange rate structure breaks on FDI flows in order to attract a steady inflow of foreign investment.

Host countries monetary policy is vital in playing the role of attracting foreign direct investment by creating a conducive economic environment. However, the characteristics of monetary policy presents the impossible trinity, that is a trilemma problem where trade-offs must be done in order to maintain economic stability. (Lahréche-Révil & Bénassy-Quéré, 2002; Collier & Dollar, 2001).

Accordingly, the dynamic relationship between exchange rate structural breaks and FDI flows is of interest to policy makers, international investors, business managers and academics as well. To advance the existing literature on this line of research, this research seeks new evidence regarding the relationships between exchange rate

structural breaks and FDI inflow in some Six (6) ECOWAS countries, namely Ghana, Nigeria, Ivory Coast, Togo, Burkina Faso and Mali.

1.1 Statement of the Problem

Exchange rate fluctuations cause foreign direct investment thus, depreciation in a country's currency drive away foreign investors (Lily et al, 2014; Lee & Brahmašrene, 2018). Again, another strand of literature proffered that structural breaks adversely affect foreign direct investment (Lee & Brahmašrene, 2018). Previous studies have resorted to investigate as to whether long or short run relationship exist between exchange rate fluctuations and foreign investment whilst others examined whether a bi or unidirectional causation exist between exchange rate, structural breaks and foreign direct investment and recommended policy directions (Takagi & Shi, 2011; Lee & Brahmašrene, 2018). However, these studies concentrated outside Ghana. Again, the aforementioned studies used seemly same approach rather gave divergent conclusions which calls for concern (Lee & Brahmašrene, 2018).

The importance of foreign direct investment to a country's economic growth cannot be underestimated per the postulate of (Lily et al., 2014; Lee & Brahmašrene, 2018). Notwithstanding, Ghana's net foreign direct investment has been on the dwindle side (World Bank, 2021). Factors accounting for Ghana's low foreign direct investment can be attributed to ineffective identification, devising and implementation measures regarding exchange rate variation and structural breaks in a manner that attract foreign direct investment.

The traditional strategies in identifying mitigation mechanisms to sensitive developmental issues like foreign direct investment constraints without consideration to empirical evidence hamper a state's ability in framing policies to solve the

constraint. Has there been any study in the Ghanaian perspective that reveal existence of causation between structural breaks, exchange rate fluctuations and foreign direct investment in Ghana? Has there been any study on the short and long run relationship between structural breaks, exchange rate fluctuations in Ghana? If yes has there been any study that considered variables between 2000 and 2021? These present a huge research gap and until this is explored to unveil the narrative in the Ghanaian perspective and to recommend pragmatic policy directions, foreign direct investment would continue to decline. Therefore, the necessity of the present study. The study seeks to investigate the long and short run relationship between structural breaks, exchange rate and foreign direct investment. Again, examined whether bi or unidirectional causation exist between the aforementioned variables. To the best of the author's knowledge no known study has done in this manner.

1.2 Objective of the Study

The specific objectives are to:

1. examine the effect of exchange rates movement on FDI flows.
2. find the effect of FDI flows on exchange rate movement.
3. establish the relationship between ease of doing business and FDI flows.

1.3 Research Question

1. What is the nexus between Exchange Rate Movement and FDI Flows?
2. What is the relationship between ease of doing business and FDI Flows?
3. What is the effect of FDI flows on Exchange Rate Movement?

1.4 Significance of the Study

This research will be of importance to many stakeholders. Many people will directly or indirectly benefit from the findings of the research. Specifically, the study would

benefit industrial players such as multinational corporations in their decision as to which country to invest. Again, the findings of the study would benefit policy makers by guiding them on the kind of policies to set in order to attract more foreign investors. Also, the study would benefit academia by enriching literature and serving as precedence to future studies.

1.5 Limitation of the Study

The present study just as previous studies were not without challenges. The following limitations was faced by the study. Difficult in retrieving complete data set for the under discussed variables. Again, myriad of variables according to literature affect the level of foreign direct investment nonetheless, the study only considered only two out of these numerous economic indicators which may have demeaning influence on the varying result recorded by the study.

1.6 Scope of the Study

The study centred on countries that makes up the Economic Community of West African State (ECOWAS). This frame was considered due to the bilateral traits and treaties shared by countries within this community. Again, the democratic characteristics shared by most countries in the state makes it necessary for the consideration of the ECOWAS as the focus of the study.

1.6 Organization of the Study

The study is divided into five (5) chapters. Chapter one of the study consists of the general introduction which includes; the background of the study, the statement of the problem, the objective of the study, the research questions, the significance of the study, the scope of the study, the limitations of the study, and the organization of the study. Chapter two is the literature review which gives the historic perspective of the

topic and also seeks to evaluate the works of other researchers on the subject, their approaches on the subject. Chapter three focuses on research methodology and research design. It discusses the research methodology and research design, composition of the sample, sites and population. The chapter also discusses different methods used in capturing, recording and analyzing the data collection. Chapter four looks at result and discussion. The chapter presents the findings of the study led by data presentation, interpretation and discussion. Chapter five which is the last chapter of the study well as the summary, conclusion and recommendations of the study.



CHAPTER TWO

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.0 Introduction

This chapter shall focus on theoretical review, empirical and conceptual frame work.

2.1 Theoretical Review

This section of the chapter is dedicated to reviewing theories underpinning the concept under study. FDI theory based on exchange rate analyses the relationship between FDI flows and exchange rate changes.

2.1.1 *Theory of asymmetric information*

This theory as developed by Akerlof (1978), Asymmetric information refers to the disproportionate understanding of a transaction between the parties, with one party having access to more information than the other. That generates a transaction imbalance. One of the issues with information asymmetry, which occurs before the parties engage in the investing activity, is that it results in one party having more information than the other. For example, if the country receiving the capital flows has more information than the foreign investors, they only divulge it when the arrangement is being finalized.

By giving international investors the necessary information, they require to make investment decisions, sovereign ratings play a critical role in decreasing the information asymmetry between the recipient countries of capital and outside investors. Credit ratings are crucial in decreasing information asymmetry between international investors and a receiving country, as was emphasized by (Gonenc & de Haan, 2014). This is because they make information available that is crucial for investors to know when making investment decisions, especially information

regarding opaque economies (Bianco et al., 2013). When international investors plan their investments, sovereign credit ratings offer more affordable information (in the financial industry) that they require.

2.1.2 The liquidity and economic runs theory

This theory suggests that if a country exhibits signs of having unhealthy economic fundamentals or if investors anticipate that the economic fundamentals may get worse, they will often move their money to another country (Zeng, 2017). A healthy economy is associated with less risk and high returns and therefore investors prefer healthy economies as their investment destinations. Mutize and Gossel (2018) indicate that any deterioration in the economic fundamentals may result in investment withdrawals, and if there is major spill-over that may cause capital flights. Basic quantitative and qualitative information are aspects of economic fundamentals used for the subsequent financial valuation of companies, securities, assets or currencies, and signifies the economic or financial health of an institution. Investors and analysts apply these fundamentals in asset examination developing estimates to verify if investments are worthwhile. Normally, investors evaluate economic fundamentals of a country relative to riskiness. Scholars such as Mutize and Gossel (2018) indicate that sovereign credit rating by credit rating firms is one of the economic fundamentals that is considered by global investors when they determine whether an investment destination is a good one. The admonitions of the theory give rise for the assessment of the effect of ease of doing business indicators on foreign investment in a country. Again, exchange rate as an economic fundamental serves as an indicator multinational firms consider before making optimal investment decision. This necessitates its usage and its effect on foreign direct investment by the study.

2.1.3 Portfolio equilibrium approach of capital flows

The portfolio equilibrium approach as developed by (William, 1970) seeks to explain international capital movements. It is thought to be more appropriate for estimating portfolio flows since it identifies the two most important components, such as market return and investment risk (Koepeke, 2018). When allocating their funds, international investors consider the risk in each country that might have an impact on those funds, such as sovereign credit ratings and exchange rate volatility (Al-Hassan et al., 2013). Biglaiser and DeRouen, (2006) underline how important it is for governments and foreign investors to make informed decisions, and how trustworthy information about a country's risk is one way that sovereign credit ratings can play a significant role in this process (default risk). Hyun and Kim, (2010) stress that to evaluate cross-border foreign capital, sovereign risk is essential. When sovereign ratings drop below a crucial threshold, countries often lose all access to private financial markets (Bierschenk & De Sardan, 2014). In contrast, nations with relatively high scores have constant access to capital.” The portfolio equilibrium approach caters to the factor of risk. Since the theory concerns itself with the flow of capital it necessitates the need to determine the effect of exchange rate on the foreign capital flows.

2.1.3 Institutional FDI Fitness theory

The institutional FDI fitness theory was propounded by (Wilhelms, 1998). This theory was used to explain the determinants of FDI. The ability of a country to attract, assimilate and hold foreign direct investment is termed as FDI fitness. The ability of the country to satisfy the expectations of the potential investors gives the country an edge in accessing FDI inflows. The theory tries to explain why foreign investors prefer one country over another. The roles of the government and other market participants are identified as the major factors determining the volume of FDI into a

country. With regards to the role of the government, Makoni (2015), highlight that the ability of the government to manage the economy and reduce or mitigate any risk plays a central role in attracting FDI into the country. Makoni (2015) shows that there is no investor who will be interested in investing in a country where there is a huge risk of locking his or her investment. This practically applies to the current study as the investigations concerns itself with effect of exchange rate on foreign direct investment and the effect of foreign direct investment on exchange rate movement. The theory assesses factors that encourages FDI flows into a country which economically includes ease of doing business and exchange rate. These variables were considered because any good indication would lead to a rise in the level of FDI.

2.2 Empirical Review

Gui-diby et al. (2016) examined essays on the Impact of Foreign Direct Investments in Africa. The objective of the thesis was to analyze the impact of foreign direct investment (FDI) inflows towards Africa on economic growth, industrialization, and technological transfer. Analyses aiming at studying the nexuses FDI-economic growth and FDI- industrialization were based on macroeconomic data from respectively 50 and 49 African countries observed during the period from 1980 to 2009; and analyses on FDI related technological spillovers are based on Kenyan firm-level data observed in the manufacturing sector during the period 2012/2013.

Concerning the FDI-economic growth nexus, it is found that FDI inflows had a significant impact on economic growth in the African region during the period of interest. It also finds that while the low level of human resources did not limit the impact of FDI, and that the impact of FDI on economic growth was negative or non-significant during the period from 1980 to 1994 and positive during the period from

1995 to 2009. The results indicate that FDI most likely did not have a significant impact on the industrialization of African countries. Concerning the existence of FDI-related technological transfer, it was found that FDI inflows did not spur innovation in local firms competing against multinational firms. By employing ARDL bounds test approach, Lily et al. (2014) studied exchange rate movement and foreign direct investment in Asian economies. The paper empirically analyses the exchange rate movements and foreign direct investment (FDI) relationship using annual data on ASEAN economies, that is, Malaysia, the Philippines, Thailand, and Singapore. The empirical results show the existence of significant long-run cointegration between exchange rate and FDI for the case of Singapore, Malaysia, and the Philippines with all countries recording negative coefficient implying that the appreciation of Singapore dollar, Malaysian ringgit, and the Philippine peso has a positive impact on FDI inflows.

Using the ECM based ARDL approach for causality test, both Singapore and the Philippines shows long-run bidirectional causality between exchange rate and FDI whereas long-run unidirectional causality running from the exchange rate to FDI in Malaysia. Furthermore, the study also found that short-run unidirectional causality running from the exchange rate to FDI exists in Singapore. Meanwhile, in Ghana Enu et al. (2013) explored the impact of macroeconomic factors on foreign direct investment: a cointegration analysis. The main objective of the study was to find out the major macroeconomic determinants of foreign direct investment in Ghana between the periods 1980 to 2012. All the variables considered were integrated at first order, as a result the Johansen's cointegration approach was used and the result showed that the variables were not cointegrated. Therefore, the vector autoregressive model was estimated. The result showed that the first past year of foreign direct

investment, the last two years of exchange rate and trade openness were statistically significant. Based on the findings the research recommended that policies that encourage foreign direct investment, moderate exchange rate depreciation and increasing trade openness should be implemented. Cambazoğlu, (2016) a bound test cointegration approach that is based on the Autoregressive Distributed Lag Model (ARDL) to examine the relationship between foreign exchange rate and foreign direct investment in Turkey. The study tries to test the hypothesis that there exists a reciprocal relationship between FDI inflows in Turkey and the real exchange rate level. Time series data for the period from January, 2007 to January, 2015 were used to investigate the effect of real exchange rate on foreign direct investment in Turkey in a long run. The results obtained from a long-term static analysis of estimated ARDL model revealed that there is a cointegration relationship between the exchange rate level and FDI inflows in Turkey.

A study conducted in Mexico by Parajuli, (2012) examining the relationship between the exchange rate, foreign direct investment and trade. The study examines the relationship between FDI, exports, and economic growth in the context of FDI from developed to developing countries (Mexico). The second chapter analyzes the relationship of FDI with the level of the exchange rate, exchange rate volatility, and exchange rate expectations during the period from 1994 to 2008. The analysis revealed a significant impact of level of exchange rates and exchange rate expectations on FDI flows. Regional trade agreements, such as the European Union (EU) and the North American Free Trade Agreement (NAFTA), were important factors to attract FDI. The third chapter examines the long-run relationship between U.S. FDI and U.S exports to Mexico from 1988Q1 to 2008Q4. This analysis found a complementary (positive) relationship between FDI and exports.

However, the strength of the relationship differs with different types of FDI. The analysis further revealed a weak complementary relationship with exports of processed food and a strong positive relationship with manufacturing exports. The study also showed a significant impact of NAFTA on manufacturing and total FDI and an insignificant impact on processed food FDI. Chapter four examined Granger causality among GDP, exports, and FDI in Mexico for the period of 1970 to 2008. The causality was tested from the bivariate to the multivariate framework using Toda and Dolado and Lütkepohl (1996) (TYDL) methodologies. An important finding in this study is the Granger causality from gross fixed capital formation and labor force to imports. The results suggest that the Granger causality between GDP and exports; FDI and GDP; exports and FDI observed in two, three or four variable frameworks are through a channel of imports. Bilawal et al., (2014) studied the exchange rates have main role that affect the macroeconomics performance of any leading country. The objective of this research was to investigate whether uncertainty or fluctuations in exchange rate affects the macroeconomic in Pakistan.

The study was based on secondary and time series data. For this purpose, 32 years old data of Exchange rate and FDI for the period of 1982 to 2013 was used and was collected from the website of State Bank of Pakistan. The tests of Correlation and regression analysis were applied through SPSS software to check the relationship between Exchange rate and FDI. The correlation results showed that there is positive significant relationship between Exchange rate and Foreign Direct Investment while in regression analysis the value of R-square = 0.679 which shows that the independent variable Exchange has 67% impact on dependent variable Foreign Direct Investment and research model was accurate. Felix and Otieno (2012) also wrote on the impact of exchange rate fluctuation on foreign direct investment in Kenya. The main objective

of the research project hence was to examine the impact of exchange rate fluctuations on the much needed foreign direct investments in Kenya. The exchange rate regimes in Kenya have been influenced through historical government macroeconomic policy from fixed exchange rate regimes to pegged and later floating through liberalization in the nineties. The exchange rates have been characterized by significant fluctuations with the local currency hitting historical highs and lows. Time series data for exchange rate fluctuation and foreign direct investments to Kenya between 1981 and 2010 were collected from Central Bank of Kenya and the World Bank Country data websites for analysis. The standard deviations for the exchange rates were derived for each year under study to determine the fluctuations. The absolute figures of the foreign direct investments data to Kenya was transformed through logarithmic transformation for normalization purposes. Pearson moment correlation was used to examine the relationship between exchange rate fluctuations and foreign direct investments over the period of study.

From the collected data it was observed that while 1987 and 2002 recorded the lowest fluctuations in exchange rates and fairly low net foreign capital inflows into the country, conversely 1993 recorded the highest exchange rate fluctuations and the relatively high foreign direct inflows. This should point at a strong relationship between the two variables. However, the inferential analyses found a weak relationship between exchange rate fluctuations and foreign direct investments. The best line of fit also revealed a positive for exchange rate fluctuations plotted against the logarithm of net foreign direct investments in current prices of tens of millions of United States dollars. This means that an increase in the exchange rate fluctuations leads to an increase in the foreign capital inflows. However, the finding was made less important by the insignificant relationship between the two variables. Hence the

conclusions drawn from the study finding suggest that the impact of exchange rate fluctuations in attracting FDI was insignificant. The study recommended that policy makers should put less effort in influencing exchange rates fluctuations in the bid to attract foreign direct investments to the country (Felix & Otieno, 2012). On the other hand, a study that sought to unearth the relationship between ease of doing business and foreign direct investment in Serbia deployed dynamic and correlational analysis for the consideration of the interdependence of ease doing business measures. The findings revealed that ease of doing business indicators such as enforcing business contract, getting operational permit, access to credit have positive relationship with foreign direct investment (Janačković & Petrović-Randelović, 2019).

However, another account of the study state that access to electric power, registering property have negative influence on foreign direct investment connoting that increment in these factors impedes influx of foreign investors in a local economy (Janačković & Petrović-Randelović, 2019). The findings bring various policy implication to economic policy makers on the factors that need much attention if a country want to attract more foreign investors to invest money to raise investment in a specified emerging market. Similarly, an empirical apprehension that sought to investigate the linkage between ease of doing business and foreign direct investment flows in sub-Saharan Africa used forty-five countries within the sub-region with a data period spanning from 2004 to 2018, through a system generalized method of moment estimation approach, the outcome showcased that ease of doing business measures play an instrumental role in influencing the level of foreign direct investment a country receives in the sampled countries within the sub-region (Nketiah-Amponsah & Sarpong, 2020). The research specifically, pointed that enhancement in the rate of starting a business, considerable tax rate on corporate

earnings with proper tax administration significantly entice foreign and multinational corporations into an economy. The research contributes to literature by introducing a quantitative impact of ease of doing business on foreign direct investment inflows. The assertions of this study directly correlate with some portion of the findings of (Janačković & Petrović-Randelović, 2019) in their study that alluded that ease of doing business have positive relationship with foreign direct investment in republic of Serbia. The study failed to incorporate other measures of doing business to assess its relationship with foreign direct investment as done by (Janačković & Petrović-Randelović, 2019) who considered the different measures of ease of doing business. In similar account, to investigate the effect of ease of doing business on the level of foreign direct investment flows in southern African countries, the enquiry deployed Generalized Moment of Method technique with a sample size of sixteen countries and a data period spanning from 2010 to 2019.

The findings revealed that ease of doing business is positively related to foreign direct investment flows into the southern Africa sub-region (Matete, 2021). The research put forward that the degree of foreign inflows into the region is significantly interrupted by the rate of corruption in the aforementioned region. The discovered result coincides with the position of Janačković & Petrović-Randelović, (2019); Nketiah-Amponsah & Sarpong (2019) who in their separate studies on the relationship between ease of doing business and foreign direct investment flows unanimously concluded that a significant and positive relationship exist between ease of doing business and foreign direct investment. Conversely, the account of the study deviated from the findings of Janačković and Petrović-Randelović, (2019) who posited that other measures of ease of doing business such as getting access to electric power, solvency have negative relationship with foreign direct investment. Bosire (2019)

enquired whether better business regulatory environment translates to high foreign direct investment inflows with emphasis on eastern African countries. The investigation sampled twelve countries that falls within the study's jurisdiction with a data collection period covering 2004 to 2017. Through the application of ordinary least square estimation technique on a panel pooled data, the study discovered that there is a significant positive relationship between ease of doing business and foreign direct investment into the region. The pronouncement supports the earlier account of Nketiah-Amponsah and Sarpong (2019); Matete (2021) who in their study on the relationship between ease of doing business and foreign direct investment flow concluded that better ease of doing business facilitate foreign direct investment inflows. The same account disagrees with the position of Janačković & Petrović-Randelović, (2019) who documented in the research that some measures of ease of doing business such solvency measures discourage foreign direct investment flows into a country.

The study is said to be microscopic in nature since Africa is made up of more than 50 countries therefore using only twelve countries doses not necessarily reflect the reality on the ground so long as the continent of Africa is concerned. To explore the nexus between the ease of doing business and foreign direct investment indicators in Zimbabwe through a time series analysis Mahuni and Bonga (2017) employed a trend analysis to check the movement of ease of doing business measures over the period 2004 to 2016. Further, a time series data from 2009 to 2016 was considered for analysis through Ordinary Least Square Regression (OLS), the study uncovered that, four measures of ease of doing business namely enforcing contract, paying taxes on corporate income, access to credit and getting electricity are significant positive determinant of foreign direct investment. These findings support the position of

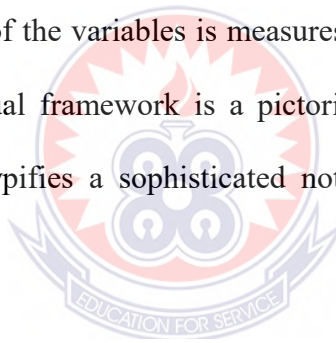
Nketiah-Amponsah and Sarpong (2019); Matete (2021) who posited that ease of doing business measures such as getting access to electric power positively relate to foreign direct investment inflows. Conversely, the finding by Mahuni and Bonga (2017) contravenes the conclusion of Janačković & Petrović-Randelović, (2019) who opined that ease of doing business measures such as getting access to electric power negatively relate to foreign direct investment. The divergent in the findings between the two studies can be attributed to the peculiar conditions that prevails in the countries in which these separate studies were conducted. The findings can be contended to some extent since using time series data to find whether ease of doing business measures leads to higher foreign direct investment through ordinary least squares estimation would not serve the purpose than using a causality approach which might have served the right purpose.

To add to the knowledge of the nexus between ease of doing business and flow of foreign direct investment and how these interrelated variables play a remarkable role in capital flight among countries, Shabani and Parang (2018) used a dynamic panel model with data stream collected from East Asian countries from 2004 to 2015. The empirical test revealed that ease of doing business have inverse and exert significant negative impact on foreign capital flows. The enquiry pointed out that a percent rise in ease of doing business causes a decrease of 0.09 percent in capital flows from foreign countries. This conclusion supports the position of Janačković & Petrović-Randelović, (2019) who in the study of the relationship between foreign direct investment and ease of doing business proffered that a negative relationship exists between ease of doing business and foreign direct investment. Notwithstanding, the account of the study debunks the assertion of Matete (2021); Nketiah-Amponsah and Sarpong (2019); Mahuni and Bonga (2017) who in their studies on the subject under

discussion posited that a direct and significant relationship exist between ease of doing business indicators and foreign direct investment.

2.3 Conceptual Review

This section of the study is devoted for the discussion of concept that serves as a build up toward the construction of a conceptual framework on the Exchange rate movement, ease of doing business and foreign direct investment nexus. The framework developed in the study can be taken as a guide by researchers and policy makers in their quest to comprehend the machineries via which exchange rate varies, ease of doing business indicators changes and influence foreign direct investment. The model shows how the assumed effect may differ, alternate or reciprocate contingent on how each of the variables is measures and proxied in a study. It should be noted that a conceptual framework is a pictorial display of intellectual idea. A conceptual framework typifies a sophisticated notional construction of experience (Chin & Kramer, 1999).



The authors furthered by differentiating conceptual framework from theoretical framework by noting that theoretical framework refers to the theory that underpins a study, conceptual framework on the other hand is the theory in action. Said differently, conceptual framework demonstrates the position of the enquirer in relation to the topic under review and gives unannotated direction for exploring the topic. The framework can be an output of a ground breaking work, modification of existing work to fit current purpose or adoption of existing framework (Chin & Kramer, 1999). The framework constructed in the study has two primary parts and further segmented into two, the causal variables termed as the regressors and the effect variable used as the regressand and control variables. Initially, literature shows that foreign direct

investment is dependent on myriad of factors including exchange rate and ease of doing business. The next sub-component of the framework is composed of variables proxied as controls which are economic indicators assumed to also exert an influence on the level of foreign direct investment in an economy. The third part of the framework represents foreign direct investment which serves as the dependent variable. This was used in the study as a result of the use of net direct inflows to measure foreign direct investment in extant literature (Felix & Otieno, 2012; Bilawal et al., 2014). A distinguishing feature of the constructed framework is that it brings to bear the weakness and strength of the proxied variables for policymakers to gauge which of the contemporary measures of foreign direct investment should be given much attention. It can be observed from the figure 1 below that myriad of variables influences foreign direct investment. The implication from this is that the state of economic indicators of a country could significantly affect the foreign direct inflows of a country. For instance, Lily et al., (2014) documented that strong macroeconomic fundamental of an economy positively impact foreign direct investment. Gui-diby et al (2016) posited that maintaining a strong economic outlook serve as a recipe that entice foreign investors looking for lucrative sectors in a stable economy to invest to choose to pump in their capital. The urge to increase the level of foreign investment into a country can be facilitated by eliminating unwarranted barriers to motivate expatriate to increase their investment.

2.3.1 Conceptual Framework and Hypotheses development

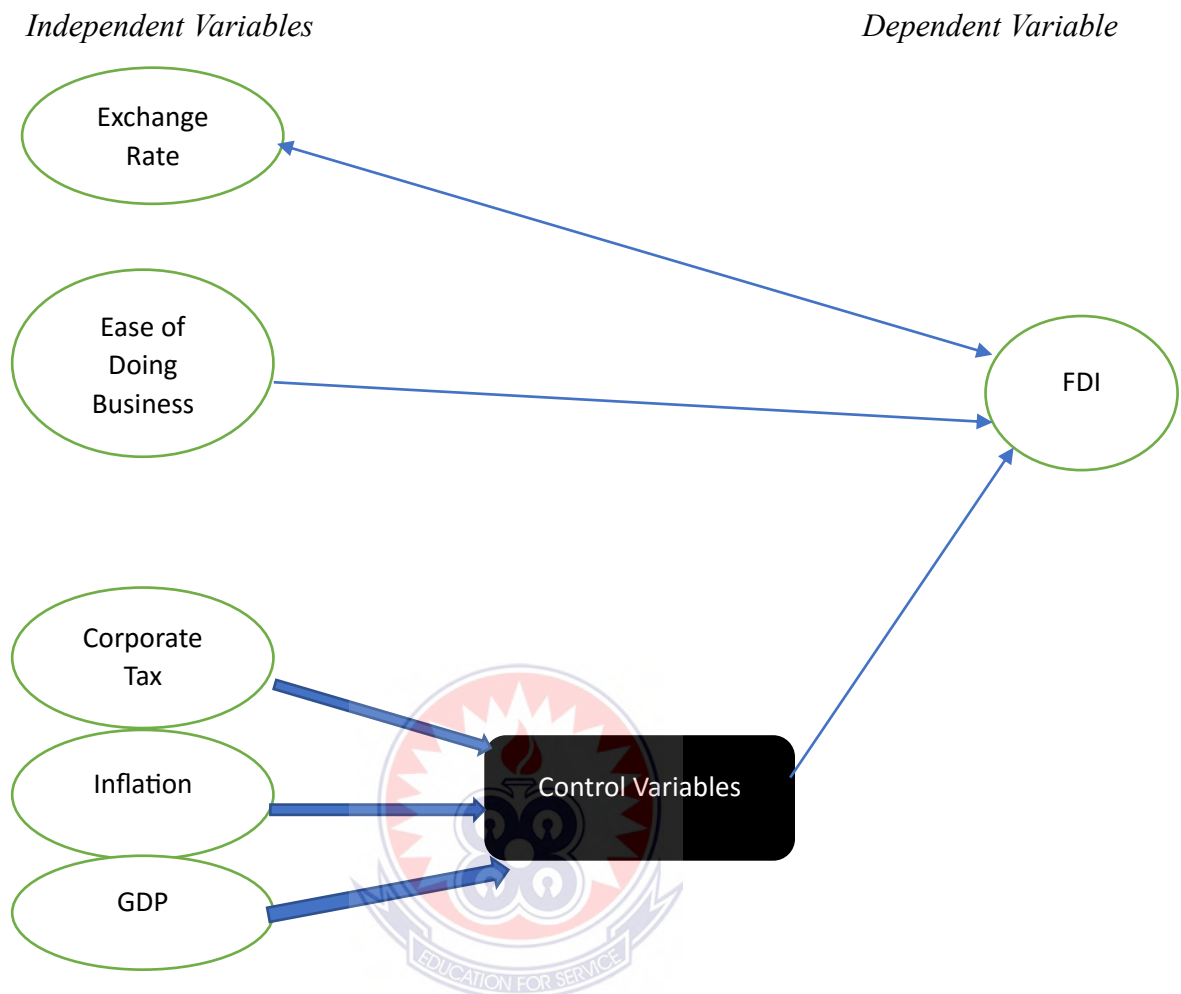


Figure 1: Conceptual Framework

Author's Construct (2022).

The above pictorial presentation demonstrates the relationship between the independent variables and the dependent variable. Specifically, Exchange Rate Movement (EXRM) is assumed to cause an effect on the dependent variable in question Foreign Direct Investment (FDI) within an economy. The relationship assumes that the level of foreign direct investment flows into a country is propelled by the level of exchange rate of the country in question with major trading currencies. Similarly, the level of foreign direct investment in a country is assumed to trigger an effect on the level of exchange rate in an economy. Therefore, in this cause-and-effect

relationship, the study assumes a bi-causal relationship between exchange rate movement and foreign direct investment. Thus, a reciprocal relationship as put forth (Felix & Otieno, 2012). Again, Ease of doing business as a measure of the business friendliness of a country is proxied to affect the level of foreign capital flowing into a country. The independent variable Ease of Doing Business (EODB) is assumed to influence the level of foreign direct investment.

2.4 Hypothesis Development

Upon review of existing studies, diverse argument has been put forth with others confirming earlier conclusions whilst others also refute certain claims regarding exchange rate movement and foreign direct investment. Parajuli (2012) concluded that exchange rate of a country's currency to major trading currency exert significant impact on foreign direct investment in a country. Bilawal et al (2014) also emphatically alluded that exchange rate has significant positive relationship with foreign direct investment. Premised on this evidence, the study hypothesizes that;

H₁: There is statistically significant positive relationship between exchange rate and foreign direct investment.

According to extant literature ease of doing business indicators exert significant explanatory power in determining the level of foreign direct investment a country attract (Nketaiah-Amponsah & Sarpong, 2019). The author furthered that the relationship between these indicators and foreign direct investment is positive. This assertion supports the account of Matete (2021) who concluded that there is positive association between ease of doing business and the rate foreign direct capital flows into an economy. Notwithstanding, Shabani and Parang (2018) argued that there is a negative association between the indicators used in assessing ease of doing business and the level of foreign direct investment in a country. In support of this argument is

the posit of (Janačković & Petrović-Ranđelović, 2019). Owing to the above exegesis, the study hypothesizes that;

H₂: There is positive relationship between ease of doing business and foreign direct investment.

In an enquiry to establish the relationship between foreign direct investment level and exchange rate, Lily et al (2014) concluded that a positive association exist between foreign direct investment and exchange thus the more a country receives foreign capital flow the stronger the country's currency becomes. Adding to this strand of literature is the account of Felix and Otieno (2012) unequivocally posited that there is a reciprocal relationship between foreign direct investment and exchange rate movement. Based on this dichotomy in the literature the present study formulates this hypothesis.

H₃: Foreign direct investment has positive effect on exchange rate movement.



CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter discussed the methodology applied in this study. The design of this research; including the procedure selected for data collection sampling technique, population, research design was highlighted here. To achieve the objective of the study, the method of data analysis including estimation technique were elaborated in this chapter.

3.1 Research Design

This research was based on a casual explanatory statistical study aimed at establishing the impact of exchange rate movement and FDI structure breaks in developing countries: evidence from ECOWAS. The research used panel secondary data for exchange rate movement or fluctuation and FDI inflows for the ECOWAS between the period 2010 to 2021 which is a 11-year period. This period selected enabled the researcher to have a representative analysis of data for both FDI inflows and exchange rate movement. This was considered to be an appropriate data sample to draw fair conclusions.

3.2 Population

The target population for this research included all the countries of the ECOWAS economy for data relating to foreign direct investment and exchange rates. The foreign exchange rates data used are yearly averages whilst for FDI figures collected were annual net aggregate disbursements to these countries for each year in focus. This involves every sovereign state within the specified setting totalling 15 countries.

3.3 Sample

The sampling frame was based on time series annual data of the independent and dependent variables from 2010 through 2021. This period was sampled based on available data for real effective exchange rates and FDI on the IMF (regional Economic Outlook) and the World Bank country data websites respectively.

3.4 Data Collection

To be able to conduct this research secondary data of exchange rates and FDI inflows in ECOWAS was collected. The research was designed to examine the exchange rate trends both under the fixed rate regimes, the pegged rate regimes in the years under study and in the floating rate regime which prevails to date. Hence time series data was collected from 2010 to 2021 to capture these different exchange rate regimes. The real effective exchange rates data was extracted from Central Bank of Ghana data archives while for FDI inflows, data was extracted from the World Bank Country Data website in current USD prices. This research focused on observing correlations and economic indicator trends, and required a large amount of economic data from 2010 to 2021. The selection process was designed to ensure maximum data availability in the sample, thus reducing the probabilistic error from non-respond error (Albright, Winston & Zappe, 2006).

3.5 Data Analysis and Model Specification

Descriptive and inferential analyses were used to analyse the data, all in an effort to investigate the relation between exchange rate movement to foreign direct investment in these ECOWAS countries. The variables for data collection were exchange rates and FDI net flows to ECOWAS, yearly, over a 11-year period from 2010 to 2021 due to data constraints. Engle granger least square was employed as the estimation

technique. Multivariate correlation analysis was used to evaluate the relationship between exchange rate movement and FDI structural breaks. Using Pearson Correlation (r), the most commonly used bivariate correlation technique; the association between these two quantitative variables was estimated. In determining the relationship between exchange rate movement and FDI structural breaks a simple conceptual model below was used. The logarithm of FDI structural breaks as a reciprocal millions of dollars for transformative purposes to normalize the data.

$$\text{Log (FDI)} = f (\text{EXRM}) \dots\dots\dots (1)$$

Where; Log (FDI) is a function of the exchange rate movement. This independent variable is measured as standard deviation of nominal exchange rate and defined as mean adjusted relative change in exchange rate squared. Theoretically it is expected that higher exchange rate variability reduces FDI inflows due to increased risk and increased uncertainty on contracts denominated in foreign currency (Marco, 2012).

The model will be linearized for estimation by the following statistical model.

$$\text{LFDI} = \alpha_0 + \alpha_1 \text{LEXRM} + \alpha_2 \text{LGDP} + \alpha_3 \text{IF} + \alpha_4 \text{CT} + \epsilon_1 \dots\dots\dots (2)$$

$$\text{LFDI} = \alpha_0 + \alpha_1 \text{EODB} + \alpha_2 \text{LGDP} + \alpha_3 \text{IF} + \alpha_3 \text{LEXRM} + \alpha_3 \text{CT} + \epsilon_1 \dots\dots\dots (3)$$

$$\text{LEXRM} = \alpha_0 + \alpha_1 \text{LFDI} + \alpha_2 \text{LGDP} + \alpha_3 \text{IF} + \alpha_4 \text{CT} + \epsilon_1 \dots\dots\dots (2)$$

Where $\text{EXRM} = \frac{\sqrt{\sum_{i=1}^n (R_i - R_{i-1})}}{n-1}$

And

FDI = Foreign Direct Investment

EODB = Ease of doing Business

R_i = Current exchange rate

R_{i-1} = Mean exchange rate of the immediate previous year

n = Number of years

α_0 = the intercept of the equation

α_1 = the parameter estimates of EXR

ϵ_t = Error Term?

Σ = Summation across the years

All other factors that can influence FDI other than exchange rate, ease of doing business and the control variables is assumed to be included in the error term. The data for FDI and exchange rate movement would be plotted on a graph to find the best line of fit for the variables if appropriate. If the coefficient of EXRM is found to be positive and statistically significant then exchange rate movement (uncertainty) positively affects FDI inflows in the host country. If the coefficient is negative and statistically significant, exchange rate fluctuation negatively affects FDI inflows. An insignificant coefficient implies that there is no effect.

3.6 Variable Measurement

3.6.1 Ease of Doing Business

Ease of doing business are the indicators that are deployed to assess the economic and business friendliness of an economy. The variable is measured using myriad of indicators and subject per the author's preference as which one to choose over the other owing to the current discussion. The variable is measured based on access to electricity, access to good road network among others. The inclusion of the variable was inspired by the institutional FDI fitness theory (Wilhelms, 1998) as well as its previous use by Janačković and Petrović-Randelović, (2019); Nketiah-Amponsah and Sarpong (2019); Matete (2019).

3.6.2 Inflation

This refers to the rise in general prices of goods and services which when persist leads to increase in the cost of living. The variable is measured by consumer price index per a defined period. The inclusion of the variable in the present study was motivated by literature (Mutize & Gossel, 2018; Otieno, 2012).

3.6.3 Gross Domestic Product (GDP)

Gross Domestic Product refers to the measure of the monetary value of goods and services produced in a country within a defined fiscal period. The variable is measured by summing the production of goods and services during the accounting period under consideration. The inculcation of the variable was motivated by the liquidity and economic run theory (Wilhelms, 1998; Zeng, 2017), institutional FDI fitness theory as well as credence given by literature (Mutize and Gossel, 2018).

3.6.4 Corporate Tax

This refers to the amount levied on the disposal income of companies. Thus, the rate r portion of a company's earnings paid to the state for the use of national resources such as roads among others. The variable is measured as a fraction or a percentage of a company's earnings before tax. The addition of the variable in the study was as a result of its usage in extant literature (Shabani & Parang, 2018; Mahuni and Bonga, 2017). Again, since it an indicator for corporations' investment decision making it consideration was inspired by the liquidity and economic run theory (Zeng, 2017).

3.6.5 Foreign Exchange Rate

This refers to the rate at which a country's currency is traded for the other dominating currencies. The rate at which each currency is traded depends on the strength of that currency under consideration. The measurement uses the real time strength of the

currencies under discussion in exchange for the other. The inculcation of the variable in the study was motivated by the liquidity and economic run theory and its application in extant literature (Makoni, 2015).

3.6.6 Foreign direct Investment

This refers to the total amount of capital that flows from external source into a country. It is measured by net inflows thus, the total outflow less total inflow. The consideration of the variable was based on the institutional FDI fitness theory (Wilhelms, 1998) and motivated by extant literature (Enu et al., 2013; Lily et al., 2013).

3.7 Ethical Consideration

This study was conducted in accordance with internationally acceptable principle guiding conduct of academic research. The protocols regarding research were observed which include but not limited to disclosing to any unauthorized person sources from which information was obtained for the research. Guidelines governing conduct of research or thesis writing in University of Education Winneba (2018) was fully observed by the study.

CHAPTER FOUR

RESULT AND DISCUSSION

4.0 Introduction

This chapter of the study present the ascertained result from the various statistical tests, analyze it and compares the findings. This analysis gives room for comparison between the study findings and that of existing knowledge in literature.

4.1 Descriptive

Since in empirical studies that adopt quantitative approach uses series of statistical data, it is important for descriptive statistics to be run in order to know the characteristics of the data under discussion. Owing to this axiom, the measures of central tendency and measures of dispersion were used to explore the characteristics of the data. The highest mean for the series was recorded by Ease of Doing Business (EODB), followed by log of Gross Domestic Product (LGDP), log of Exchange Movement (LEXRM). On the measure of the middle part of the series, the highest median was recorded by ease of doing business whilst Inflation (IF) proxied by consumer price index recorded the lowest median of the study. The maximum value of the series was registered by ease of doing business nonetheless the lowest minimum value was registered by inflation.

On the measure of dispersion, corporate tax was the variable that dispersed most from the center of the series followed by ease of doing business notwithstanding, log of foreign direct investment least deviated from the center of the series. Measuring the thickness of the respective variables in the series with the use of kurtosis demonstrated that corporate tax was the thickest in the series whilst log of gross domestic product registered the lowest thickness. The position of the individual

variables in the distribution showed that with the exception of log of exchange rate and log of foreign direct investment which were positively skewed, the remaining variables fell on the left side of the distribution.

Table 1: Descriptive Statistics

	LFDI	LGDP	LEXRM	IF	EODB	CT
Mean	19.44784	23.04586	5.838113	5.183453	49.20222	17.63889
Median	19.48346	23.10075	6.204142	2.778070	47.90000	16.20000
Maximum	22.80574	27.02712	9.253345	23.56351	67.10000	57.00000
Minimum	13.87378	20.56060	0.419121	-3.233389	33.50000	0.000000
Std. Dev.	1.454059	1.524081	1.819276	5.782433	6.523194	10.12705
Skewness	-0.232767	0.705480	-0.624481	1.204983	0.680648	2.036482
Kurtosis	3.584008	3.299360	4.091585	4.002031	3.594160	8.579181
Jarque-Bera	4.090435	15.60318	20.52133	51.09004	16.54613	357.8723
Probability	0.129352	0.000409	0.000035	0.000000	0.000255	0.000000
Sum	3422.820	4148.254	1045.022	933.0216	8856.400	3175.000
Sum Sq. Dev.	370.0002	415.7850	589.1379	5985.139	7616.819	18357.73
Observations	176	180	179	180	180	180

Source: Author's estimate.

4.2 Correlation

In statistical analysis a relationship study between variables requires a test of possible relationship between the variables under consideration. In order to ascertain if the understudied variables correlate, Pearson moment correlation was estimated for all variables. The registered result presented in table 1 below shows that the strongest correlation of 0.72 was recorded between log of gross domestic product and log of foreign direct investment. Followed by the correlation between inflation and corporate tax. The study observed a positive correlation between log of exchange rate and inflation, ease of doing business. Again, log of exchange rate and log of foreign direct investment, ease of doing business and corporate tax all recorded negative correlation.

On the wholes, the weakest correlation was observed between ease of doing business and corporate tax.

Table 2: Correlation Matrix

	LFDI	LEXRM	LGDP	IF	EODB	CT
LFDI	1					
LEXRM	-0.28	1				
LGDP	0.702	-0.098	1			
IF	0.274	-0.091	0.198	1		
EODB	0.212	-0.508	0.114	0.253	1	
CT	-0.036	0.284	0.029	0.539	-0.036	1

Source: Author's estimate.

4.3 Diagnostics

Diagnostics are checks carried out in a statistical analysis to ensure the data being used are fit for the test as well as checking whether the adopted model are appropriate for the study in order to arrive at accurate findings and conclusions. The study therefore tests the fitness of the data and the model through the following diagnostic tests.

4.3.1 Normality test

Normality test is a necessary requirement when dealing with quantitative data in statistical analysis. This test is conducted to ensure that the data used are free from biases. The study used the Jarque Bera normality test which test the null hypothesis that there is no normality in the dataset at 5% significance level. Based on Jarque Bera p-values ascertained which were less than the 0.05 rejection level on table 2 above the study reject the null hypothesis and concludes that the series is normal.

4.3.2 Heteroskedasticity

To assess whether the variance of the residual across the x values are equal, the study employed heteroskedasticity test that test the null hypothesis that the residuals are homoscedastic at 5% significance level. From table 3 below the result showed a p-value 0.987 which is above the rejection level of 0.05, on that note the study fails to reject the null hypothesis and conclude that the series is free of heteroskedasticity.

Table 3: Panel Period Heteroskedasticity LR Test

	Value	df	Probability
Likelihood ratio	5.513781	15	0.9868
LR test summary:			
	Value	df	
Restricted LogL	-312.0961	169	
Unrestricted LogL	-309.3392	169	

Source: Author's estimate.

4.3.3 Cointegration Test

To ensure that the variables in the study cointegrate and to ascertain the order of cointegration in order to carry on the subsequent test, the study employed the Johannsen panel cointegration test which test the null hypothesis that there is no cointegration and alternative hypothesis that common autoregressive coefficient within-dimension at a rejection level of 5%. From the table 4 below the panel Augmented Dickey-Fuller-statistic showed a p-value of 0.000 since this is less than the significance level of 5% the study rejects the null and conclude that the variables cointegrate. As a confirmatory test to the above conclusion, the Panel Philip-Perron-statistic test was conducted which test the same null hypothesis at 5% significance level, due to the recorded p-value which is below 0.05 the study rejects the null and concludes that the variables cointegrate.

Table 4: Panel Cointegration Test

	<u>Statistic</u>	<u>Prob.</u>	<u>Weighted</u>	<u>Statistic</u>	<u>Prob.</u>
Panel PP-Statistic	-16.11740	0.0000		-9.202941	0.0000
Panel ADF-Statistic	-9.439264	0.0000		-4.604873	0.0000
	<u>Statistic</u>	<u>Prob.</u>			
Group PP-Statistic	-15.38830	0.0000			
Group ADF-Statistic	-8.137874	0.0000			

Sources: Author's construct.

Table 5: Toda and Yamamoto augmented Granger Causality Test

Dependent Variable	Excluded Variables	X²	Prob
LFDI	LEXRM	0.758	0.001*
	EODB	3.840	0.013**
	IF	3.434	0.180
	CT	7.349	0.025**
	LGDP	18.671	0.000*
LEXRM	LFDI	0.410	0.815
	EODB	0.936	0.626
	IF	3.917	0.041**
	CT	0.605	0.739
	LGDP	0.494	0.781
EODB	LFDI	1.753	0.416
	LEXRM	0.023	0.989
	IF	12.806	0.002**
	CT	6.625	0.036**
	LGDP	8.585	0.014**
IF	LFDI	0.984	0.611
	LEXRM	6.026	0.409
	EODB	1.830	0.400
	CT	2.441	0.295
	LGDP	0.229	0.892
CT	LFDI	12.318	0.002*
	LEXRM	0.356	0.837
	EODB	6.230	0.044**
	IF	4.691	0.067**
	LGDP	19.281	0.00*
GDP	LFDI	2.117	0.347

LEXRM	2.040	0.361
EODB	0.123	0.940
IF	0.881	0.644
CT	0.323	0.851

*Note: depict * $p < 0.01$, ** $p < 0.05$ and *** $p < 0.10$*

Source: Author's construct

4.4 Discussion of Findings

This section of the study presents the discussion for the various result ascertained from the study's statistical tests.

4.4.1 Causality between FDI and independent variables

To assess the possibility of causality between foreign direct investment inflows into the ECOWAS and independent variables, the study employed the Toda and Yamato granger causality approach to test the anticipated relation. Since the data set showed presence of non-stationarity at level, Toda and Yamamoto approach was selected at the expense of the conventional granger causality method due to the strength of the technic in neutralizing any form of unit root in a data series. After subjecting the variables into the causality test, the result depicted that exchange rate movement had a coefficient of 0.758 and probability of 0.001.

This signifies that exchange rate is significance at 1%. This result means that volatility in exchange rate granger causes foreign direct investment thus, past movement in exchange rate can be used as a prerequisite to forecast the level of foreign direct investment flowing into the ECOWAS region. This confirms the account of (Enu et al., 2013) whose study on the causation between exchange rate and foreign direct investment obtained the same result. Again, the result also translates that exchange rate relates to foreign direct investment in the short run. Similarly, Ease

of Doing Business (EODB) showed a coefficient of 3.840 at 5% which shows that ease of doing business granger causes foreign direct investment. The previous values of ease of doing business can be used to predict the future level of foreign direct investment entering into the ECOWAS region. The business systems and structures implemented in an economy in the past can be used to determine the level of foreign capital that would flow into an economy. Further, the statistical output revealed that inflation rate does not granger cause foreign direct investment in an economy in the short run. However corporate tax demonstrated a coefficient of 7.349 at 0.025 significant level implying that the amount of tax levied on corporate income do relates to the level of foreign investment made by expatriate firms in an economy. Conversely, the Toda and Yamamoto result showcased that GDP granger causes foreign direct investment owing to the significance value of 0.000. This stand to reason that the level of industrial production of goods and services within an economy influence the choice of investors in choosing their investment destination in the ECOWAS region. This confirms the effect result ascertained by the regression estimation by the study. On the other hand, when exchange rate was proxied as the dependent variable foreign direct investment showed no causality on the basis that it recorded a p-value of 0.815 which is way above all the significance level tested thus, 1%, 5% and 10% respectively.

This finding contradicts the argument as put forward by Cambazoglu (2016); Lily et al (2014) in the study on the causation between exchange and FDI and concluded that the variables cointegrate and relates to each other. This signifies that there is a uni-causality between foreign direct investment and exchange rate movement. ease of doing business showed no causality with exchange rate movement in the ECOWAS region. Inflation recorded a coefficient of 3.917 and p-value of 0.041 which is

significance at 5% level, this shows inflation granger causes exchange rate movement. This result means that rise in general price of goods and services granger causes exchange rate movement. Thus, previous consumer price index can be used as a yardstick to predict future exchange rate movement. This result is inconsistent with the findings of (Parajuli, 2012).

Corporate tax rate and gross domestic product showed no causality with exchange rate volatility. This connotes that both variables do not influence the rate of exchange rate movement in the ECOWAS region. The study recorded that foreign direct investment does not granger cause ease of doing business based on a p-value of 0.416 which is above the significance rate. This finding stands to reason that historical data of foreign direct investment cannot be reliably used to accurately estimate the level of easiness an economy posse to attract expatriate businesses. The study can therefore assert that there is uni-causality between ease of doing business and foreign direct investment. Furthermore, exchange rate volatility registered a p-value of more than 10%, which signifies that the variable does not granger cause ease of doing business. Thus, past records of exchange rate variation is not a significant factor that can be proxied to predict the future level of ease of doing business. This shows that no causality exists between the aforementioned variables.

However, inflation rate, corporate tax and gross domestic product granger causes ease of doing business. This result depicts that the previous rise in the consumer price index, corporate tax and past values of goods and serves produced in an economy do influence and can be depended on to forecast the level of ease of doing business. Notwithstanding, when inflation was proxied as the dependent variable none of the variables under discussion granger caused inflation signifying that existing trend of

these variables cannot be reliably used to predict future consumer price index in the ECOWAS. This demonstrate that a unidirectional relationship exists between ease of doing business and inflation as only inflation granger cause ease of doing business. Nonetheless, only exchange rate volatility showed no causality with corporate tax with remaining variables showing causality with corporate tax at 1%, 5%, 10% and 1% for foreign direct investment, ease of doing business, inflation rate and gross domestic product respectively. This result means that the level of foreign business entering into the ECOWAS sub-region can significantly influence the rate of corporate tax charged by member countries. Again, easy access to business facilitation mechanisms in the region can also influence the tax percentage levied by countries in the region. The general rise in goods and services can be used as a tool to forecast the rate of corporate tax in the ECOWAS. Gross domestic product which measures the monetary value of total good and services produced by an economy in a defined fiscal period tremendously influence the rate of tax charged in an economy. As a country with high GDP would be tempted to charge a minute portion of corporate income as tax in order to attract more multinational firms.

Finally, when GDP was proxied as the dependent variable, none of the variables under review showed a causality indicating that historical values of exchange rate movement, corporate tax rate, inflation, foreign direct investment and ease of doing business can be reliably used to forecast the level of good and services production in an economy. To find the effect of the various independent variables on the dependent variable the study employed multivariate regression method with Engle Granger Least Square estimation technique. The model registered R-squared value of 0.56 and 0.59, adjusted r-squared value of 0.54 and 0.55 for random and fixed effect respectively. Premised on the fact that R-squared in regression analysis measures the percentage of

variation in the dependent variable accounted for by the hypothesized regressors, 56% would have been the explained portion by the regressors. However, since R-squared increases in a monotonic order thus addition of any variable increases the r-squared value the study preferred the use of the adjusted r-squared in order to avoid the kitchen sink problem. This means that the regressors explained 54% and 55% variation in the dependent variable which is way above the 70% threshold. Testing the significance of the entire model using the f-statistics indicated that the model is very significant for the study based on prob (f-statistic) of 0.00 for both estimations.

4.4.2 Effect of Exchange Movement (EXRM) on Foreign Direct Investment (FDI)

Since the model has been declared significant for the study, the effect of exchange rate movement on foreign direct investment is measured. The regression result between exchange rate movement and foreign direct investment showed a p-value of 0.00 and 0.02, a coefficient of -0.13 and -0.07 for random and fixed effect estimation respectively. This indicates a significant negative relationship between exchange rate movement and foreign direct investment. Based on this result, the study rejects the null hypothesis (1) and concludes that foreign exchange rate movement have significant negative relationship with foreign direct investment. The finding indicates that structural break exerts significant power in explaining the level of foreign capital flows into an economy. The continuous variation in a country's currency against major trading currencies discourages foreign direct investors. The ascertained result also means that in times of structural breaks foreign investment flows decline at significant rate.

The identified relationship connotes that in times of deteriorating currency value foreign business become sceptical and withdraw from investing in such economy with

the fear of losing their investment. Besides, foreign investors losing their investment by investing in a country whose currency is declining in value against other currencies, multinational corporations cease investing in such economies because repatriation of profit after the financial year into their home currency would be worth less. The adduced finding supports the posit of (Marco, 2012). Since structural breaks may be caused by civil war, political uproar, structural shake in government machinery these identified conditions significantly impede business growth thereby scaring foreign investors. For example, a typical structural break can be caused by the current ongoing economic war between Ukraine and Russia. Since no rational investors would be motivated to invest in a war-plunged country the level of existing multinational companies would cease operation and relocate to any peaceful country that can guarantee them of their investment returns. This gives credence to the identified relationship in the study. Another reason for the inverse relationship is that the cost of living becomes high, few people are left with enough money to spend, due to this situation produced goods become expensive coupled with lower sales margins making it unattractive for foreign investors to invest in such economies.

The labour force in such an economy would be demanding more in pay rise, extra conditions of service from their employers and failure to meet these demands may lead to industrial actions such as strike and picketing which significantly reduce productivity making investment not worthwhile. A classical specimen of the above exegesis is what Ghana is experiencing in the public sector. In the perspective of the institutional foreign direct investment theory which explains the factors that induce foreign direct investment into countries, according to the admonition of the framework, countries with ailing currency would attract less volumes of foreign investment (Wilhelms, 1998). This confirms the expectation of the institutional FDI

fitness theory. The finding by the study confirms the assertion of Cambazoğlu, (2016); Enu et al (2013) who concluded in their studies that exchange rate movement exert significant influence on the level of foreign direct investment flowing into a country. result of random and fixed estimation presented on table 8 and 10 below.

4.4.3 Effect of ease of doing business on foreign direct investment flows

Through the multivariate regression test with Engle Granger Least Square estimation technique the study tested the effect of ease of doing business on foreign direct investment flows. The test registered a coefficient of 0.0003, 0.0298 and p-value of 0.000, 0.15 for random and fixed effect estimations respectively signifying a positive yet insignificant relationship between ease of doing business and foreign capital flows into a country. Based on this result the research fails to reject the null hypothesis and conclude that there is a positive relationship between ease of doing business and flow of foreign capital into a defined economy. The recorded result means that better business environment encourages foreign flow of capital. However, the result was insignificant in determining the level of foreign direct investment in a country.

The observed direct relationship signifies that when a country's ease of doing business indicators are in better shape it paint a good picture about the country and present it as a better investing ground ahead of countries with less ease of doing business. This makes such country a preferred investment destination for multinational corporations who want to grow their brand beyond their country incorporation. Improved in ease of doing business have positive relationship with foreign direct investment flows because it serves as a guarantee for secured investment. Since there is a guarantee of safe investment every rational investor would like to invest in such economy. Ease of doing business indicators like access to

electric power, cheap labour as well as access to credit entice investors since availability of these indicators means there would be ease of expanding the business within the invested country.

Countries with torn out ease of doing business indicators coupled with ailing economy stand to attract low level of foreign capital. This connotes that countries that intentionally implement policies aimed at strengthening the various indicators of ease of doing business have positive balance on its current account. This explains the reason war plunged countries within the sub-region have negative net foreign direct investment. Countries with prolong insecurity records and fragile economy records lower level of foreign direct investment. For instance, the structural policies implemented by countries in the sub-region like Ghana by providing industrial park and free zones, moratorium among others for companies in the automobile industry significantly attracted a colossal number of renowned automobile companies like Volkswagen, Sino truck, Renault, Nissan, Toyota and Suzuki.

The observed relationship by the study supports the account of Nketiah-Amponsah & Sarpong (2019); Matete (2021) who in the study to unearth the relationship between ease of doing business indicators and foreign capital flows into the southern African region and sub-Saharan Africa documented that there is a positive relationship between ease of doing business and foreign direct investment. Similarly, the account of Mahuni and Bonga (2017) who alluded in their study that the mechanisms used in measuring ease of doing business have positive effect on foreign direct investment thus, improvement in such variables encourages foreign business to invest in such economies. Notwithstanding, the same aha moment contradict the conclusions of Janačković and Petrović-Randelović, (2019) and Shabani and Parang (2018) who

augured that ease of doing business indicators have significant explanatory power on the level of foreign direct investment in a country but have negative relationship with capital flows into a country. The discrepancies in the findings by these distinct studies can be attributed to the difference jurisdiction of the studies and the approach adopted by the authors toward their exploration. Gross Domestic Product (GDP) proxied as a control variable in finding its effect on foreign direct investment registered a coefficient of 0.61 and 0.62 with significance values of 0.00 for both estimations respectively. This indicates that there is a positive and significant relationship between gross domestic product and foreign direct investment. The level of economic growth in a country possesses the significant explanatory power in determining the level of foreign investment attracted by a country. According to Organization for Economic Cooperation and Development (OECD, 2002) gross domestic product is the standard measure of the total quantity of goods and services produced in a country for a defined accounting period. This signifies that the total number of goods produced in a country stand to influence the appetite of investors for possible investment in such economy. Thus, increased in the production of goods and services in a country means that the country is doing well economically.

Again, high gross domestic product for a country signifies that such country is very productive and this influence investors in a positive manner. Increased in gross domestic product level for a country means that such country has in place business friendly environment. therefore, this would attract multinational corporations looking for possible investment areas to invest their capital. A country that put in place measures to resource the local industries would achieve high gross domestic product which when coupled with peaceful political atmosphere present the country as preferred investment destination. Improvement in gross domestic product exert

positive significant effect on foreign direct investment in the West African sub-region because it portrays to the business world that such region has good standard of living and investing there would be worthwhile. When standard of living is high crime rate would be minimal with *ceteris paribus* and this encourage expatriate firms to invest in such countries since that country stand a better chance of having conducive business atmosphere for firms to thrive. This result supports the position of Puri and Sengupta (2020); Kumar (2014) who documented in their study on the relationship between gross domestic product and foreign direct investment that gross domestic product positively associate with foreign flow of capital. Again, the result as explained above confirms the pronouncement of Khan and Hussain (2012). Inflation as measured by consumer price index and proxied in the study as control variable demonstrated a coefficient of 0.003 and insignificance value of 0.81 which signify that there is a negative but insignificant relationship between inflation rate and foreign direct investment. The observed relationship means that in times of rising inflation there would low level of foreign direct investment. The result stand to reason that when price of general goods and services in a country are also on the rise without consumer receiving a commensurate rise in salaries, they would not be able to afford goods and service that they use to afford with their level of income.

Since a dollar today worth less than a dollar tomorrow, consumers would possess less purchasing power when there is soar in inflation. Low purchasing power means sellers of goods and services would also record lower sales during times of rising inflation, this would send a bad signal to foreign investors and paint a picture that investing in such economy is not worthwhile. This phenomenon would therefore decrease the level of foreign direct investment pumped into a country. In a similar vein, within any economic space, rising inflation increases the price of factors of

production such as land, labour and raw materials, this increment is directly translated into higher production cost and consequently rendering finished product expensive and difficult to afford by the ordinary consumer.

This analogy would scare foreign investors as every rational producer would prefer producing in a country with relatively lower cost of production. On this note, countries with hyperinflation would have less foreign direct investment inflows compared to a country with relatively stable inflation. Since inflation has the potential of affecting other related macroeconomic variables such as interest rate, rising inflation increase interest rate and discourage businessmen to seek for loan to expand their firms, rising inflation cause labour to demand more from employers which if not complimented with satisfactory pay rise may lead to industrial unrest. Hyperinflation also limits the quantity of goods and services consumed by citizens leading to lower gross domestic product values. Due to the observed negative relationship between inflation and foreign direct investment, any country which experiences the above economic conditions would certainly record lower levels of foreign capital flight since such indications drive away multinational corporations in an economic space.

Another possible reason that account for the inverse relationship between inflation and foreign direct investment is that investing in a country that experiences frequent hyperinflation is not worthwhile because repatriation of earned profit into home countries reduces the value of the profit. The explained result is in tandem with Sabir, Rafique and Abbas (2019) who in their study that sought to establish the relationship between inflation and economic growth concluded that there is a negative relationship between the two variables thus, rising inflation significantly impede economic growth. Nonetheless the account as put forward by Mengistu and Adhikary (2011);

Shah and Khan (2016) in their studies that investigated the relationship between economic policies and indicators and its linkage with foreign direct investment concluded that positive linkage exists between these variables. The observed discrepancies in the finding are attributed to the varying degree of methodologies employed by the two studies. Differences in jurisdiction can also account for the divergence in findings. Corporate tax as measured by the effective tax levied on the profit made by corporations proxied as a control variable in the study showed a coefficients of -0.016 and -0.015 at significant values of 0.10 and 0.13 for random and fixed effect estimations respectively. This points out that an inverse relationship exists between corporate tax and foreign direct investment flows. The result means that the rate of tax levied on the profit of corporations possess explanatory power in determining the level of foreign direct investment into an economy thus corporate tax rate exert a negative impact on the level of foreign investment in a country. The ascertained result means that if corporate tax rise by a percentage it culminates into 0.07 percent decline in foreign direct investment. Rational investors would always expect to pay a menial portion of their profit as taxes therefore they would prefer putting their capital at investment destination where tax rate on corporate income is low.

Firms may source out their capital from lenders or plough back their profit in their quest of expanding their boundaries therefore may not be motivated to invest in economies where taxes on corporate income take chunk portion of a firms end of year profit. Aside, using profit to pay workers and other operational expenses, multinational corporations also engage in corporate social responsibilities such as building hospitals, building school blocks among others which increases their reputation. Monies allocated for these projects all comes from the corporate income

so if the destination country's corporate tax rate are high foreign companies may not be enticed to invest in such economies and this would lead to lower levels of foreign investment. Moreover, the result point that countries with unfavourable tax administration where it takes longer number of days in filling tax as well as getting tax clearance and refund would attract less foreign direct investment. The finding by the study concurs with the pronouncement made by Janačković & Petrović-Randelović (2019) in the research that sought to investigate the relationship between paying taxes and foreign direct investment and discovered an inverse relationship. The discovery by the study that negative relationship exists between foreign direct investment and paying taxes supports the account as put forward by Shabani and Parang (2018) who concluded that the association between paying taxes and foreign direct investment is negative. Conversely, the same aha moment debunk the assertion by Mahuni and Parang (2018) who alluded that paying taxes has positive significant relationship with the level of foreign direct investment in a country. See table 11 and 13 below.

4.4.4 Effect of FDI on EXRM

To assess the effect of foreign direct investment flows as proxied by log of net foreign direct investment on exchange rate movement as measured by log of exchange rate of local currencies to the dollar, multivariate regression with Engle Granger Least Square estimation technique was conducted. The model recorded an r-square of 21%, 22 and adjusted r-square of 14% and 19% for random and fixed effect respectively. Due to the monotonic nature and kitchen sink phenomenon the study preferred the use of adjusted r-squared to measure the total explanatory power of the regressors. Premised on this, the independent variables explained 14% and 19% variations in exchange rate movement.

The model recorded f-statistics probability of 0.00 for both estimation indicating that the model is very significant in explaining the effect of exchange rate movement on foreign direct investment flows into a country. On the measured effect of foreign direct investment on exchange rate movement the model registered a coefficient of -0.36 and -0.37 with p-values of 0.0002 and 0.0001 for random and fixed effect estimations respectively which is less than the 5% rejection level. The study rejects the null hypothesis (3) that there is a positive effect of foreign capital flows on exchange rate movement. The observed result indicates that foreign direct investment possesses significant explanatory power on exchange rate movement however, it affects exchange rate in a negative direction. The finding means that when foreign corporations invest in a destined local economy, they undertake some parts of their business in foreign currencies leading to influx of dollar in the local economy causing the destined country's currency to fall in value against such foreign currency. Again, the influx of multi-million foreign corporations in an economy requires quoting some of their products and services in foreign currencies this act causes the local currency to depreciate against the foreign denomination. The observed negative effect of foreign direct investment on exchange rate also arises as a result of these corporations converting colossal sums of local currency to import implements that are not readily available in the local economy which result in abnormal pressure on the local currency leading to depreciation in value.

The control variables in this relationship being it gross domestic product and corporate tax rate registered a positive and significant for corporate tax yet insignificant for gross domestic product. On the other hand, inflation as a control variable in the model depicted a negative relationship with exchange rate movement which means that in times of rising inflation the local currency becomes weak and

depreciate against major world trading currencies like the United State dollar, British pounds, German euros among others. The true reflection of the observed relationship is the current situation in Ghana where the west African country is experiencing hyperinflation with current inflation pegged at 40.2% (Ghana Statistical Service 2022; International Monetary Fund, 2022) coupled with abnormal depreciation of the Ghanaian cedi against the United State dollar and major trading currencies. The adverse effect of foreign direct investment on exchange rate movement discovered by the study confirms the account of Okafor, Ezeaku and Izuchukwu (2016) who discovered in their study on the relationship between foreign direct investment and exchange rate of the Nigerian naira that foreign direct investment exerts negative impact on the Nigerian naira. Nonetheless, the registered finding refutes the argument as put forward by Nadia, Ambar and Farza (2015) that foreign direct investment exerts positive significant effect on exchange rate movement. The observed difference can be attributed to the jurisdictional differences in the above studies. The discussed result is presented on table 12 and 14 below.

Table 6: Effect of LEXRM on FDI (Random effect estimation)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.088617	1.399108	4.351786	0.0000***
LEXRM	-0.132100	0.050593	-2.611032	0.0098**
LGDP	0.613870	0.049522	12.39585	0.0000***
IF	0.047111	0.016507	2.853911	0.0049**
EODB	0.000397	0.013520	0.029346	0.9766
CT	-0.016247	0.009839	-1.651217	0.1006
Weighted Statistics				
R-squared	0.557585	Mean dependent var	19.44580	
Adjusted R-squared	0.544495	S.D. dependent var	1.457979	
S.E. of regression	0.984006	Sum squared resid	163.6373	
F-statistic	42.59877	Durbin-Watson stat	0.820081	
Prob(F-statistic)	0.000000			

Source: Author's construct. *Note: *, ** and *** denote significance at 10%, 5% and 1%.*

Table 7: Correlated Random Effects - Hausman Test

Test Summary	Chi-Sq. statistic	Chi-Sq. d.f.	Prob.
Period random	7.139783	5	0.2105

Source: Author's construct. *Note: *, ** and *** denote significance at 10%, 5% and 1%.*

The study preferred the use of random effect estimation over the fixed since it failed to reject the null hypothesis that the random estimation is appropriate for the data. This declaration is premised on the p-value of 0.21 which is above the 5% significance level.

Table 8: Effect of EXRM on FDI (Fixed effect estimation)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.972467	1.625221	2.444262	0.0156
LEXRM	-0.067085	0.056443	-1.188547	0.2364
LGDP	0.626729	0.049859	12.57005	0.0000
IF	0.041359	0.017227	2.400742	0.0175
EODB	0.029872	0.017747	1.683197	0.0943
CT	-0.015034	0.009976	-1.506937	0.1338

Effects Specification

R-squared	0.587396	Mean dependent var	19.44580
Adjusted R-squared	0.545614	S.D. dependent var	1.457979
S.E. of regression	0.982797	Akaike info criterion	2.895267
Sum squared resid	152.6107	Schwarz criterion	3.202703
Log likelihood	-236.3359	Hannan-Quinn criter.	3.019972
F-statistic	14.05838	Durbin-Watson stat	0.826136
Prob(F-statistic)	0.000000		

Source: Author's construct. *Note: *, ** and *** denote significance at 10%, 5% and 1%.*

Table 9: Effect of Ease of Doing Business on FDI (Random effect estimation)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.088617	1.399108	4.351786	0.0000
EODB	0.000397	0.013520	0.029346	0.9766
LGDP	0.613870	0.049522	12.39585	0.0000
IF	0.047111	0.016507	2.853911	0.0049
LEXRM	-0.132100	0.050593	-2.611032	0.0098
CT	-0.016247	0.009839	-1.651217	0.1006

Weighted Statistics

R-squared	0.557585	Mean dependent var	19.44580
Adjusted R-squared	0.544495	S.D. dependent var	1.457979
S.E. of regression	0.984006	Sum squared resid	163.6373
F-statistic	42.59877	Durbin-Watson stat	0.820081
Prob(F-statistic)	0.000000		

Source: Author's construct. *Note: *, ** and *** denote significance at 10%, 5% and 1%.*

Table 10: Correlated Random Effects - Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	7.139783	5	0.2105

Source: Author's construct. *Note: *, ** and *** denote significance at 10%, 5% and 1%.*

The study preferred the use of random effect estimation over the fixed since it failed to reject the null hypothesis that the random estimation is appropriate for the data. This declaration is premised on the p-value of 0.21 which is above the 5% significance level.

Table 11: Effect of Ease of Doing Business on FDI (Fixed effect estimation)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.972467	1.625221	2.444262	0.0156
EODB	0.029872	0.017747	1.683197	0.0943
LGDP	0.626729	0.049859	12.57005	0.0000
IF	0.041359	0.017227	2.400742	0.0175
LEXRM	-0.067085	0.056443	-1.188547	0.2364
CT	-0.015034	0.009976	-1.506937	0.1338

Effects Specification			
R-squared	0.587396	Mean dependent var	19.44580
Adjusted R-squared	0.545614	S.D. dependent var	1.457979
S.E. of regression	0.982797	Akaike info criterion	2.895267
Sum squared resid	152.6107	Schwarz criterion	3.202703
Log likelihood	-236.3359	Hannan-Quinn criter.	3.019972
F-statistic	14.05838	Durbin-Watson stat	0.826136
Prob(F-statistic)	0.000000		

Source: Author's construct. Note: *, ** and *** denote significance at 10%, 5% and 1%.

Table 12: Effect of FDI on LEXRM (random effect estimation)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.088280	2.083831	3.881446	0.0001
LFDI	-0.372323	0.128671	-2.893593	0.0043
LGDP	0.176316	0.116626	1.511801	0.1324
IF	-0.080943	0.027778	-2.913890	0.0040
CT	0.075966	0.015950	4.762926	0.0000

Weighted Statistics			
R-squared	0.207785	Mean dependent var	5.812165
Adjusted R-squared	0.189145	S.D. dependent var	1.824387
S.E. of regression	1.642815	Sum squared resid	458.8032
F-statistic	11.14705	Durbin-Watson stat	0.105797
Prob(F-statistic)	0.000000		

Source: Author's construct. Note: *, ** and *** denote significance at 10%, 5% and 1%.

Table 13: Correlated Random Effects - Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	1.552909	4	0.8172

Source: Author's construct. *Note: *, ** and *** denote significance at 10%, 5% and 1%.*

Table 14: Effect of FDI on LEXRM (fixed effect estimation)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.061694	2.092408	3.852830	0.0002
LFDI	-0.362234	0.132370	-2.736526	0.0069
LGDP	0.169176	0.119398	1.416909	0.1585
IF	-0.087914	0.028546	-3.079735	0.0024
CT	0.077767	0.016113	4.826353	0.0000

Effects Specification

R-squared	0.217500	Mean dependent var	5.812165
Adjusted R-squared	0.143679	S.D. dependent var	1.824387
S.E. of regression	1.688244	Akaike info criterion	3.972231
Sum squared resid	453.1768	Schwarz criterion	4.261583
Log likelihood	-331.5702	Hannan-Quinn criter.	4.089600
F-statistic	2.946324	Durbin-Watson stat	0.099497
Prob(F-statistic)	0.000375		

Source: Author's construct. *Note: *, ** and *** denote significance at 10%, 5% and 1%.*

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

5.0 Introduction

This chapter serve as the final part of the study and present the summary of the study, the conclusion drawn from the various empirical findings and the recommendation made by the study based on the drawn conclusion. It provides highlight on the methodologies used in exploring the topic under consideration which includes the data collection technique, the sample among others. The research aimed to find the effect of exchange rate movement as proxied by log of the rate of domestic currencies of the sampled countries to the dollar on foreign direct investment as measured by log of net direct FDI flows, finding the effect of ease of doing business on the level of foreign direct investment and examine the effect of foreign direct investment flows on exchange rate movement. Specifically, the study was built on three research questions as follows;

1. What is the effect of exchange movement on foreign direct investment?
2. What is the relationship between ease of doing business and foreign direct investment flows?
3. What is the effect of foreign direct investment on exchange rate movement?

The study used data collected from all the countries that forms the Economic Organization of West African State ECOWAS with data spanning from 2010 through 2021, the multivariate regression with Engle Granger Least Square estimation approach was employed, Pearson product moment correlation, cointegration and unit root test were performed to ensure high precision of result. The study also assessed

the possibility of causality from the independent variables to foreign direct investment through the Toda and Yamamoto augmented granger causality test.

5.1 Summary of Findings

The various findings discovered by the statistical test are summarized below.

5.1.1 Effect of exchange rate movement on foreign direct Investment

The statistical result demonstrated that there is a significant negative relationship between exchange rate movement and foreign direct investment. Thus, exchange rate volatility inversely impacts the level of foreign direct investment flows. This finding to some degree deviates from findings by previous studies who documented a positive relationship see (Marco, 2012).

5.1.2 Relationship between ease of doing business and foreign direct investment

Upon series of statistical tests, the study observed a positive relationship between ease of doing business and foreign direct investment flows. Thus, better ease of doing business indicators encourage foreign capital flows into a country. This connotes that countries that ensure good indicators of ease of doing business would have more foreign corporations vouching to pump more capital into their economy. This finding contradicts with conclusions made by existing studies Bonsire (2019); Mahuni and Bonga (2017) whilst some assertions by other studies that inverse relationship exist between ease of doing business and foreign direct investment refutes the claim made by this study (Mahuni & Parang, 2018; Janačković & Petrović-Randelović, 2019).

5.1.3 Effect of foreign direct investment flows on exchange rate movement.

The result for the tested relationship between foreign direct investment and exchange rate movement showcased that foreign direct investment has negative association and

impact negatively on exchange rate movement. This means that their bi-directional relationship between foreign direct investment and exchange rate movement. This means that a country that records positive net direct inflows of foreign investment put pressure on its local currency since some portions of that corporation's dealings would be quoted in foreign currencies. This finding supports the position of Okafor, Ezeaku and Izuchukwu (2016). Notwithstanding, this account contravenes the argument as championed by Nadia, Ambar and Farza (2015). The observed disagreement of the study's finding from literature is attributed to the diverse circumstances under which the various studies were conducted which includes but not limited to different methodologies, different data span and different setting.

5.2 Conclusion

The ascertained result from the various statistical test calls for the following conclusions.

In the first place since the statistical test found an inverse association between exchange rate movement and foreign direct investment, the study concludes exchange that rate movement have negative effect on foreign direct investment in the Economic Organization of West African states (ECOWAS) region.

Again, since there was a positive association between ease of doing and foreign direct investment, the study concludes that improvement in ease of doing business attract foreign direct investment in countries in West African sub-region. Finally, the study concludes based on the link between foreign direct investment and exchange rate that continuous influx of multinational corporations affects exchange rate of the country adversely. Thus, the more a country attracts foreign investment the more the country's currency deteriorates. Ease of doing business in ECOWAS and exchange rate

volatility granger causes foreign direct investment. The novelty aspect of the study is that per the knowledge of the author no known study has explored the underlying topic in the selected setting within the considered time frame. The study also brings new insight on the bi-directional relationship observed between exchange rate movement and foreign direct investment.

5.3 Recommendation

The myriad findings by the study calls for various recommendations. The study therefore makes the following implorations. In the first place, the central government should implement various measures that would automatically regulate the level of local currencies against major dominating currencies in order to keep moderate level of foreign direct investment. Again, the study recommends that governments in west Africa should develop pragmatic economic policies that would strengthen their ease of doing business measures in order to become preferred investment destination for multinational corporations looking for business friendly locations to invest their capital. Since there is a uni-causality from EXRM and EODB to foreign direct investment government should implement pragmatic economic policies to control these variables to achieve optimal foreign capital flows. Finally, the study implores policy makers to encourage local industries by giving them tax incentives to keep them growing and give quota to foreign firms in order to limit their infiltration coupled with undue competition with local industries since overdependence on foreign direct investment was identified by the study as putting more pressure on local denominations.

5.4 Recommendation for further studies

The study upon the diverse findings ascertained implores academic to collaborate with industry to explore the topic into detail emplacing important on incorporating

different dimensions or indicators and increasing the sample base as well as data period.



REFERENCE

- Akerlof, G. A. (1978). The economics of "tagging" as applied to the optimal income tax, welfare programs, and manpower planning. *The American Economic Review*, 68, 819.
- Albright, S. C., Winston, W. L., & Zappe, C. J. (2011). *Data analysis and decision making* (4th ed.). Mason, Ohio: Southwestern/ Cengage Learning.
- Al-Hassan, A., Papaioannou, M. M. G., Skancke, M. & Sung, C. C. (2013). *Sovereign wealth funds: Aspects of governance structures and investment management*. UK: International Monetary Fund.
- Bianco, M., Bontempi, M. E., Golinelli, R., & Parigi, G. (2013). Family firms' investments, uncertainty and opacity. *Small Business Economics*, 40(4), 1035-1058.
- Bierschenk, T., & De Sardan, J.-P. O. (2014). Studying the dynamics of African bureaucracies. An introduction to states at work. In *States at Work*, 3-33). Brill. London: *SAGE*.
- Biglaiser, G., & DeRouen, K. (2006). Economic reforms and inflows of foreign direct investment in Latin America. *Latin American Research Review*, 41(1), 51-75.
- Bilawal, M., Ibrahim, M., Abbas, A., Shuaib, M., & Ahmed, M. (2014). Impact of exchange rate on foreign direct investment in Pakistan. *International Journal of Finance*, 2(6), 223-231.
- Bosire, E. M. (2019). Does better business regulatory environment translate to increased foreign direct investment inflows? Evidence from Eastern Africa. *International Journal of Economics and Financial Issues*, 9(4), 119-136.
- Cambazoglu, B. (2016). The relationship between foreign exchange rate and foreign direct investment in Turkey. *European Journal of Finance*, 11(1), 284-293.
- Cem, P. & Burcak, P. (2012). The impact of exchange rate uncertainty on foreign direct Investment into Turkey. WEI international academic conference.
- Chinn, P. L. & Kramer, M.K. (1999). *Theory and nursing: Integrated knowledge development*, (5th ed.). *St. Louis, MO: Mosby Inc.*
- Collier, P. & Dollar, D. (2001). *Development effectiveness: What have we learnt?* Development Research Group, the World Bank. Available from: <http://www.oecd.org/dataoecd/16/2/2664872.pdf>.

- Donald, P. & Lutkepohl, H. (1996). Testing for causation using infinite order vector autoregressive processes. *Econometric Theory*, 12(1), 61-87.
- Enu, P., Havi, E. D. K., & Attah-Obeng, P. (2013). Impact of macroeconomic factors on foreign direct investment in Ghana. *Economic Review*, 9(28), 331-348.
- Felix, B. E. N., & Otieno, O. (2012). *The impact of exchange rate fluctuation on foreign direct investment in Kenya*. Nairobi: Kenyatta University Press.
- Fezi, L. & Chigbu, U. S. (2021). Effect of foreign direct investment on exchange rate of Naira: A multi-sectoral analysis. *European Journal of Accounting, Auditing and Finance Research*, 9(4), 12-26,
- Gonenc, H., & de Haan, D. J. (2014). Firm internationalization and capital structure in developing countries: The role of financial development. *Emerging Markets Finance and Trade*, 50(2), 169-189.
- Gui-diby, S. L., Combes, J., & Renard, M. (2016). Essays on the Impact of Foreign direct investments in Africa to cite this version. *London: Macmillan*.
- Hyun, H., & Kim, H. H. (2010). The determinants of cross border M&As: the role of institutions and financial development in the gravity model. *World Economy*, 33(2), 292-310.
- International Monetary Fund (2022). Economic review report. Retrieved on 20/12/2022 from <https://www.imf.org>.
- Janackovic, M. & Petrovic-Randelovic, M. (2019). Relationship between ease of doing business indicators and the foreign direct investment inflows in the Republic of Serbia. *Economics and Organization*, 16(3), 269-282.
- Javed, Z. & Farooq, M. (2009). Economic growth and exchange rate volatility in case of Pakistan. *Pakistan Journal of Life and Social Sciences*, 2, 112-118.
- Khan, M. & Hussain, F. (2012). Palatability and animal preferences of plants in Tehsil Takht- e-Nasrati, District Karak, Pakistan. *African J. Agricult. Res.*, 7(44), 5858-5872.
- Koepke, R. (2018). Fed policy expectations and portfolio flows to emerging markets. *Journal of International Financial Markets, Institutions and Money*, 55, 170-194.
- Kumar V. (2014). Trend of FDI in India and its impact on economic growth. *International Journal of Science and Research*, 3(10).

- Lahreche-Revil, A. & Benassy-Quere, A. (2005). How does FDI react to corporate taxation?. *Int Tax Public Finan* 12, 583-603. <https://doi.org/10.1007/s10797-005-2652-4>.
- Lee, J. W. & Brahmaasrene, T. (2018). Economics and business. *Journal of Asian Finance*, 5(3), 7-17.
- Lily, J., Kogid, M., Mulok, D., Sang, L. T., & Asid, R. (2014). Exchange rate movement and foreign direct investment in Asean economies. *Tokyo: Longman*.
- Mahuni, K. & Bonga, W. (2017). Nexus between doing business indicators and foreign direct investment for Zimbabwe. A time series analysis. *Journal of Economics and Finance*, 2(2), 1-8.
- Makoni, P. L. (2015). An extensive exploration of theories of foreign direct investment. *Risk Governance & Control: Financial Markets & Institutions*, 5, 77-83.
- Marco, A. (2012). Endogenous Dollarization, Sovereign Risk Premia and the Taylor Principle. School of Economics Working Paper Series 2012-11. LeBow College of Business, *Drexel University*.
- Matete, D. (2021). *The relationship between corruption, ease of doing business and FDI inflows in SADC Countries*, (Unpublished Dissertation), Development Finance Centre, University of Cape Town.
- Mengistu, A. A. & Adhikary B. K. (2011). Does good governance matter for FDI inflows? Evidence from Asian economies. *Asia Pac Business and Review* 17, 281-299.
- Morina, F., & Hysa, E. (2020). *The effect of exchange rate volatility on economic growth: case of the CEE countries*. Thousand Oaks: Sage
- Mutize, M. & Gossel, S. (2018). The effects of sovereign credit rating spillovers on neighbouring countries' financial markets. *The Journal of International Trade & Economic Development*, 27(8), 857-900.
- Nadia, R. Ambars, S. & Faiza, S. (2015). Effects of exchange rate on foreign direct investment in Pakistan. *Inter Disciplinary Journal of Contemporary Research in Business*, 6(3), 420-816.
- Nketiah-Amponsah, E. & Sarpong, B. (2020). Ease of doing business and foreign direct investment: Case of Sub-Saharan Africa, *International Atlantic Economic Society*, 6(3), 12-43.

- Okafor, E.I., Ezeaku, H.C. & Izuchukwu, O. (2016). A disaggregated analysis on the effects of foreign investment inflows on exchange rates evidences from Nigeria. *Global Journal of Human Social Science* 15(5), 45-93.
- Parajuli, S. (2012). *LSU digital commons examining the relationship between the exchange rate, foreign direct investment and trade*. Mexico: Sage.
- Puri, R. & Sengupta, P. (2020). Exploration of relationship between FDI and GDP: A comparison between India and Its Neighbouring Countries. *Global Business Review*, 21(2), 473-489.
- Sabir, S., Rafique, A. & Abbas, K. (2019). Institutions and FDI: Evidence from developed and developing countries. *Financial Innovation*, 5, 8. <https://doi.org/10.1186/s40854-019-0123-7>.
- Shabani, Z. D. & Parang, S. (2018). The effect of ease of doing business on capital flight: Evidence from East Asian Countries. *Iran Economics Review*, 23(4), 819-838.
- Shah, M. H, Khan, Y. (2016) Trade liberalization and FDI inflows in emerging economies. *Business and Economics Review*, 8(1), 35-52.
- Takagi, S. & Shi, Z.Y. (2011). Exchange rate movements and Foreign Direct Investment (FDI): Japanese investment in Asia, 1987-2008. *Japan and the World Economy*, 23, 265-272.
- Wilhelms, S. K.S. (1998). *Institutional FDI Fitness: Determinants of foreign direct investment to emerging economies*. (PhD Thesis), Medford, MA: Fletcher School of Law and Diplomacy.
- William, W. (1970). Toward the development of an equilibrium capital-market model based on semivariance. *The Journal of Financial and Quantitative Analysis*, 9(1), 1-11.
- Zeng, Y. (2017). *A dynamic theory of mutual fund runs and liquidity management*. New Jersey: Pearson.

APPENDIX A

DATA EXTRACT FROM WORLD BANK DEVELOPMENT

INDICATORS

COUNTRY	YEAR	NUMBER	LFDI	LEXRM	EoDB	IF	LGDP	CT
GHA	2010	1	21.65044	0.419121	58.2	10.73339	24.19515	17.6
GHA	2011	1	21.89334	0.601507	60.9	8.728459	24.39544	18
GHA	2012	1	21.9152	0.683778	61.6	11.18634	24.44342	18
GHA	2013	1	21.89461	1.063529	65.4	11.66619	24.86359	18
GHA	2014	1	21.93431	1.312282	64.9	15.48962	24.72664	18
GHA	2015	1	21.81213	1.36349	65.2	17.14997	24.62335	18
GHA	2016	1	21.96761	1.470298	65.1	17.45463	24.75156	18
GHA	2017	1	21.89856	1.522861	65.3	12.37192	24.82436	18.5
GHA	2018	1	21.79079	1.651993	66.2	7.808765	24.93242	17.7
GHA	2019	1	21.91478	1.722	66.7	7.14364	24.94773	10
GHA	2020	1	21.01097	1.75884	66.9	9.88729	24.97238	10
GHA	2021	1	21.01097	1.75884	67.1	9.971089	25.07476	10
NGA	2010	2	22.35535	5.012617	44.7	13.7202	26.61341	21.7
NGA	2011	2	22.80574	5.036059	44.6	10.84003	26.72714	22.1
NGA	2012	2	22.43522	5.059425	45.8	12.21778	26.84466	21.9
NGA	2013	2	22.19009	5.058229	45.4	8.475827	26.95511	21.8
NGA	2014	2	21.84804	5.066087	46.9	8.062486	27.02712	21.8
NGA	2015	2	21.21121	5.259786	47.8	9.009387	26.91113	21.4
NGA	2016	2	21.86039	5.535332	49.5	15.67534	26.72629	20.9
NGA	2017	2	21.46622	5.722899	49.9	16.52354	26.65218	21
NGA	2018	2	19.16108	5.723859	52.2	12.09473	26.70768	21
NGA	2019	2	21.42625	5.72659	52.8	11.39679	26.82833	21
NGA	2020	2	21.72505	5.882795	53.8	13.24602	26.79237	21
NGA	2021	2	21.72505	5.882795	54.2	16.95285	26.8118	21
MALI	2010	3	19.8042	#NUM!	44.4	1.108927	23.0925	13.3
MALI	2011	3	20.12995	6.155386	47.5	2.955644	23.28784	11.2
MALI	2012	3	19.76065	6.235501	48.9	5.323128	23.24435	11.2
MALI	2013	3	19.5361	6.202332	50.1	-0.60674	23.30671	10.1
MALI	2014	3	18.78254	6.202044	50.9	0.883815	23.38806	10.1
MALI	2015	3	19.079	6.382174	50.9	1.450691	23.29624	10.1
MALI	2016	3	19.37412	6.384529	50.9	-1.79965	23.36418	10.1
MALI	2017	3	20.12222	6.36416	50.9	1.759857	23.4554	10.1
MALI	2018	3	19.96185	6.319772	50.9	0.299547	23.56064	10.1
MALI	2019	3	20.57019	6.373168	50.9	-1.65827	23.57283	7.5
MALI	2020	3	20.09908	6.355389	50.9	0.438089	23.58349	16.1
MALI	2021	3	20.09908	6.318122	50.9	3.925603	23.67524	15.2
BURKINA	2010	4	17.45802	6.204142	41.6	-0.76423	23.03675	15.2
BURKINA	2011	4	17.54055	6.155386	42.3	2.759767	23.21484	16.2

BURKINA	2012	4	19.36196	6.235501	45.7	3.818152	23.25386	16.2
BURKINA	2013	4	19.88416	6.202332	46	0.533739	23.32182	16.2
BURKINA	2014	4	19.4776	6.202044	46.5	-0.25809	23.35824	16.2
BURKINA	2015	4	19.19907	6.382174	47.5	0.724839	23.19409	16.2
BURKINA	2016	4	19.64479	6.384529	48.3	0.441041	23.27531	16.2
BURKINA	2017	4	#NUM!	6.36416	48.8	1.482999	23.36993	16.2
BURKINA	2018	4	19.11733	6.319772	49.2	1.955943	23.48896	16.2
BURKINA	2019	4	18.80278	6.373168	49.6	-3.23339	23.50693	16.2
BURKINA	2020	4	#NUM!	6.355389	49.9	1.884701	23.60994	16.2
BURKINA	2021	4	#NUM!	6.318122	52.2	3.653268	23.70579	16.2
GUINEA	2010	5	18.43409	8.652785	38.7	15.46198	22.64802	57
GUINEA	2011	5	20.67747	8.803579	38	21.35047	22.638	57
GUINEA	2012	5	20.21834	8.851639	40	15.2251	22.75641	57
GUINEA	2013	5	13.87378	8.840418	42.7	11.8879	22.84871	57
GUINEA	2014	5	#NUM!	8.85568	46.2	7.072021	22.89557	57
GUINEA	2015	5	17.69206	8.920725	48.8	10.82068	22.89736	57
GUINEA	2016	5	21.19161	9.10141	49.5	8.172117	22.87456	33
GUINEA	2017	5	20.17245	9.114745	47.9	8.914526	23.0578	33
GUINEA	2018	5	19.68223	9.106216	49.3	9.826002	23.19619	33
GUINEA	2019	5	17.58551	9.125205	51.8	9.470779	23.32171	33
GUINEA	2020	5	18.97451	9.165874	52.1	10.60186	23.37437	33
GUINEA	2021	5	19.11747	9.165874	53.6	12.59707	23.48647	33
SENEGAL	2010	6	19.39195	6.204142	43	1.228681	23.50341	15
SENEGAL	2011	6	19.48932	6.155386	42.4	3.403228	23.60327	15
SENEGAL	2012	6	19.20991	6.235501	44.2	1.418229	23.59462	15
SENEGAL	2013	6	19.44327	6.202332	44.6	0.710245	23.66342	16.2
SENEGAL	2014	6	19.74414	6.202044	44.7	-1.09026	23.70881	16.2
SENEGAL	2015	6	19.74988	6.382174	45.9	0.135212	23.60105	18.4
SENEGAL	2016	6	19.33114	6.384529	46.2	0.837285	23.66982	16.2
SENEGAL	2017	6	20.04181	6.36416	46.6	1.318153	23.76762	16.2
SENEGAL	2018	6	20.49389	6.319772	46.9	0.460986	23.86383	16.2
SENEGAL	2019	6	20.49389	6.373168	47.8	1.758565	23.87595	16.2
SENEGAL	2020	6	20.49389	6.355389	48.5	2.547435	23.92166	16.2
SENEGAL	2021	6	20.49389	6.318122	49.7	2.547435	24.042	16.2
LIBERIA	2010	7	21.44824	4.268345	40.5	7.289928	21.41541	0
LIBERIA	2011	7	21.45852	4.279809	41.4	8.488168	21.5979	0
LIBERIA	2012	7	21.56051	4.297486	44.1	6.831787	21.74989	17.6
LIBERIA	2013	7	21.41575	4.350536	46	7.577307	21.87927	17
LIBERIA	2014	7	20.03385	4.429536	47.3	9.861113	21.8944	21.6
LIBERIA	2015	7	19.26517	4.456535	47.9	7.748697	21.89484	35.4
LIBERIA	2016	7	19.55755	4.54783	48.4	8.834249	21.94658	35.4
LIBERIA	2017	7	19.32831	4.724789	48.8	12.41963	21.9443	35.4
LIBERIA	2018	7	18.67633	4.970199	49.2	23.56351	21.95371	35.4
LIBERIA	2019	7	18.27775	5.228054	49.6	23.56351	21.92311	35.4

LIBERIA	2020	7	18.27775	5.254982	49.9	23.56351	21.83512	35.4
LIBERIA	2021	7	18.27775	5.254982	50.3	23.56351	21.97223	35.4
TOGO	2010	8	17.70096	6.204142	39.4	1.445945	21.95567	9
TOGO	2011	8	20.10125	6.155386	40.3	3.563515	22.07716	9.5
TOGO	2012	8	19.51527	6.235501	42.2	2.577182	22.07737	9.5
TOGO	2013	8	19.135	6.202332	44.2	1.825395	22.1869	9.5
TOGO	2014	8	19.53566	6.202044	46.4	0.190875	22.24387	10
TOGO	2015	8	18.3241	6.382174	47.3	2.583905	22.15378	10.7
TOGO	2016	8	19.53015	6.384529	48.4	1.285247	22.52028	10.7
TOGO	2017	8	18.61241	6.36416	50.2	-0.98029	22.57886	10.7
TOGO	2018	8	19.34167	6.319772	51.8	0.928171	22.68508	10.3
TOGO	2019	8	19.52876	6.373168	51.9	0.685898	22.70018	10.3
TOGO	2020	8	17.78686	6.355389	51.5	1.82754	22.74807	10.3
TOGO	2021	8	17.78686	6.318122	51.7	1.82754	22.85307	10.3
G-BISEAU	2010	9	17.13731	6.204142	33.5	2.517851	20.5606	14.9
G-BISEAU	2011	9	17.00045	6.155386	33.7	5.046102	20.81841	14.9
G-BISEAU	2012	9	15.72857	6.235501	40.3	2.130546	20.71248	14.9
G-BISEAU	2013	9	16.79297	6.202332	41.1	1.207126	20.76832	15.1
G-BISEAU	2014	9	17.07765	6.202044	43.1	-1.50924	20.77673	15.1
G-BISEAU	2015	9	16.60237	6.382174	43.1	1.47672	20.77037	15.1
G-BISEAU	2016	9	16.45133	6.384529	44.1	1.503121	20.88794	15.1
G-BISEAU	2017	9	16.54709	6.36416	46.1	1.691115	21.0235	15.1
G-BISEAU	2018	9	16.85856	6.319772	47.1	0.381325	21.13181	15.1
G-BISEAU	2019	9	18.08197	6.373168	49.2	0.2466	21.08766	15.1
G-BISEAU	2020	9	16.84446	6.355389	51.6	0.2766	21.08217	15.1
G-BISEAU	2021	9	16.84446	6.318122	52.1	0.2966	21.21706	15.1
BENIN	2010	10	19.08803	6.204142	39.8	2.207835	22.97827	15.2
BENIN	2011	10	18.4363	6.155386	41.3	2.704239	23.09289	15.2
BENIN	2012	10	19.3012	6.235501	43.8	6.744683	23.13393	15.2
BENIN	2013	10	19.52512	6.202332	45.5	0.428889	23.25042	11.9
BENIN	2014	10	19.7777	6.202044	46.4	-0.54876	23.30987	11.9
BENIN	2015	10	18.57817	6.382174	46.4	0.218786	23.15584	11.9
BENIN	2016	10	18.5553	6.384529	46.4	-0.79405	23.19315	11.9
BENIN	2017	10	18.94538	6.36416	46.4	1.769412	23.265	11.9
BENIN	2018	10	19.03209	6.319772	46.4	0.644804	23.38089	11.9
BENIN	2019	10	19.06809	6.373236	46.4	-0.70503	23.38992	11.9
BENIN	2020	10	18.84263	6.353142	46.4	3.022721	23.47384	11.9
BENIN	2021	10	18.84263	6.318252	46.4	1.733552	23.60166	11.9
S_LEONE	2010	11	19.28962	8.288556	39	7.193536	21.67029	0
S_LEONE	2011	11	20.67248	8.377738	43.4	6.788194	21.80254	18.2
S_LEONE	2012	11	20.39816	8.376559	47.2	6.58836	22.05876	18.2
S_LEONE	2013	11	19.87852	8.3739	48	5.518271	22.31664	18.8
S_LEONE	2014	11	19.74268	8.417187	52.1	4.645462	22.33573	18.8
S_LEONE	2015	11	19.34667	8.533214	52.7	6.693679	22.1628	18.5

S_LEONE	2016	11	18.74645	8.746764	52.9	10.88329	22.02476	18.5
S_LEONE	2017	11	19.84071	8.907129	53.6	18.21981	22.03682	18.5
S_LEONE	2018	11	19.33875	8.978614	55.2	16.03279	22.13062	18.5
S_LEONE	2019	11	19.52423	9.106115	56.2	14.80306	22.12852	18.5
S_LEONE	2020	11	18.72161	9.193187	57.3	13.44698	22.12526	18.5
S_LEONE	2021	11	18.72161	9.253345	58.9	11.8727	22.15844	18.5
C_D'VIORE	2010	12	19.5661	6.204142	41.2	1.226456	24.27679	8.8
C_D'VIORE	2011	12	19.47388	6.155386	41.4	4.912434	24.32587	8.8
C_D'VIORE	2012	12	19.57111	6.235501	43.8	1.304511	24.31515	8.8
C_D'VIORE	2013	12	19.84136	6.202332	44.5	2.58117	24.47887	8.8
C_D'VIORE	2014	12	19.86321	6.202044	47.9	0.448682	24.61188	8.8
C_D'VIORE	2015	12	19.9893	6.382174	47.9	1.2515	24.54787	8.8
C_D'VIORE	2016	12	20.12401	6.384529	47.9	0.723178	24.59372	8.8
C_D'VIORE	2017	12	19.5159	6.36416	47.9	0.685881	24.66656	8.8
C_D'VIORE	2018	12	19.98025	6.319772	47.9	0.359409	24.78391	8.8
C_D'VIORE	2019	12	20.42171	6.373168	47.9	-1.10686	24.79297	8.8
C_D'VIORE	2020	12	20.38301	6.355389	47.9	2.425007	24.83984	8.8
C_D'VIORE	2021	12	20.38301	6.318122	47.9	4.091952	24.9684	8.8
C_VERDE	2010	13	18.57047	4.422193	52.9	2.078665	21.23268	18.9
C_VERDE	2011	13	18.42902	4.372947	55	4.473883	21.34702	18.6
C_VERDE	2012	13	18.57727	4.458049	57.8	2.540396	21.27819	18
C_VERDE	2013	13	17.8502	4.419714	58.1	1.506543	21.33871	18.2
C_VERDE	2014	13	18.94031	4.419256	59	-0.23878	21.34379	18.2
C_VERDE	2015	13	18.53391	4.599008	59	0.131188	21.19127	18.5
C_VERDE	2016	13	18.59029	4.602046	59	-1.40782	21.23189	18.6
C_VERDE	2017	13	18.37806	4.582996	59	0.784415	21.29413	18.6
C_VERDE	2018	13	18.34227	4.537037	59	1.256996	21.39952	18.5
C_VERDE	2019	13	18.35488	4.590008	59	1.106667	21.40729	18.3
C_VERDE	2020	13	17.95346	4.572603	59	0.605796	21.25607	18.3
C_VERDE	2021	13	18.50908	4.534942	59	1.862153	21.38398	18.3
GAMBIA	2010	14	17.43062	3.332631	46.4	5.049681	21.15718	6.1
GAMBIA	2011	14	18.36244	3.383085	46.6	4.795883	21.06664	6.1
GAMBIA	2012	14	17.75069	3.468143	47.8	4.254322	21.0704	6.1
GAMBIA	2013	14	18.10846	3.58234	50.1	5.69913	21.04216	6.1
GAMBIA	2014	14	17.37755	3.731291	49.5	5.947999	20.92984	6.1
GAMBIA	2015	14	18.12268	3.74965	52.4	6.808455	21.04403	6.1
GAMBIA	2016	14	18.08058	3.769826	53.8	7.228793	21.1184	6.1
GAMBIA	2017	14	18.07819	3.841792	55.2	8.03419	21.132	6.1
GAMBIA	2018	14	18.26391	3.874358	56.9	6.520968	21.23649	6.1
GAMBIA	2019	14	18.10199	3.913271	57.6	7.115676	21.31858	24.4
GAMBIA	2020	14	19.07851	3.941614	58.8	5.931276	21.32781	24.4
GAMBIA	2021	14	19.35759	3.94128	50.3	7.370348	21.45471	24.4
NIGER	2010	15	20.7243	6.204142	37.9	0.804073	22.78393	20.3
NIGER	2011	15	20.77954	6.155386	38.8	2.942385	22.89494	17.3

NIGER	2012	15	20.54777	6.235501	41.8	0.45509	22.96683	17.3
NIGER	2013	15	20.24294	6.202332	43.4	2.297231	23.04809	22
NIGER	2014	15	20.41444	6.202044	43.8	-0.93029	23.10862	21.5
NIGER	2015	15	20.02075	6.382174	44.3	-0.57609	22.99373	21.2
NIGER	2016	15	19.38049	6.384529	45.3	1.653889	23.06496	21.2
NIGER	2017	15	19.55086	6.36416	45.9	2.796373	23.13785	21.6
NIGER	2018	15	19.87329	6.319772	47.2	2.967604	23.27339	21.6
NIGER	2019	15	20.3451	6.373168	47.8	-2.48979	23.28177	21.6
NIGER	2020	15	19.66097	6.355389	48.4	2.898194	23.34368	21.6
NIGER	2021	15	19.66097	6.318122	48.8	3.837868	23.42804	21.6

