

**UNIVERSITY OF EDUCATION, WINNEBA**

**TERMS OF TRADE, INSTITUTIONAL QUALITY AND EXCHANGE RATE  
VOLATILITY IN THE ECONOMIC COMMUNITY OF WEST AFRICA  
STATES (ECOWAS)**



**MASTER OF PHILOSOPHY**

**UNIVERSITY OF EDUCATION, WINNEBA**

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VOLATILITY IN THE ECONOMIC COMMUNITY OF WEST AFRICA  
STATES (ECOWAS)**

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**A thesis 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 the award of the degree of  
Master of Philosophy  
(Finance)  
in the University of Education, Winneba**

**SEPTEMBER, 2023**

## DECLARATION

### STUDENT'S DECLARATION

I, **Rosemary Eshun**, declare that this thesis, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and it has not been submitted, either in part or whole, for another degree elsewhere.

Signature:.....

Date:.....

### SUPERVISOR'S DECLARATION

We hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of thesis as laid down by the University of Education, Winneba.

..... (Principal Supervisor)

Signature :.....

Date:.....

..... (Co-Supervisor)

Signature :.....

Date:.....

## **DEDICATION**

I dedicate this study to my beautiful mother; Mama Agnes Annordjoe for all her immense love, care, and support towards me.



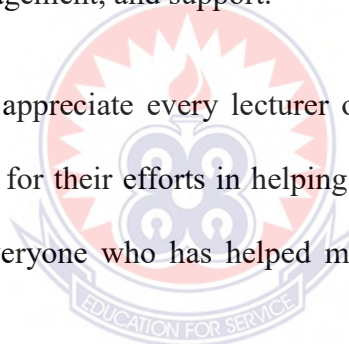
## ACKNOWLEDGEMENT

I am very thankful to my research supervisors; Dr Joesph Ato Forson and Dr Ramatu Ussif for their assistance and dedicated involvement throughout this study and a thank you to their teaching assistants.

I would like to express gratitude to my mother, for spending time to read and provide a helpful response. To Gifty Taylor and my colleagues who were of extreme help to me in the course of my work, I am incredibly grateful.

I cannot forget my daddy, Elder George Nicholas Hayfron-Taylor for all his encouragement and support. I would also like to thank my family and friends for their constant prayers, encouragement, and support.

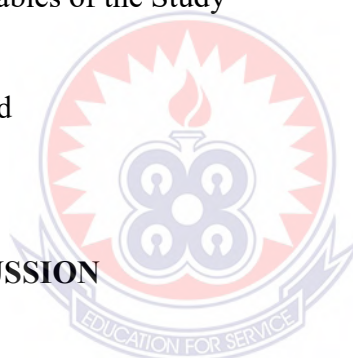
Finally, I would like to appreciate every lecturer of the applied finance and policy management department for their efforts in helping me to accomplish this task. I am extremely grateful to everyone who has helped me in any way to accomplish this study.



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## LIST OF ABBREVIATIONS

ER- Exchange Rate Returns

IF- Inflation

IQ - Institutional Quality Index

FD – Financial Development

GDP – Gross Domestic Products

TT – Terms of Trade

ED – External Debts

DS - Debts Services

RQ - Regulatory Quality

CC - Control of Corruption

GE - Government Effectiveness

PS - Political Stability

RL – Rule of Law

VA – Voice and Accountability

Log-ER - Log of Exchange Rate Returns

Log-TT – Log of Terms of Trade

Log-ED – Log of External Debts

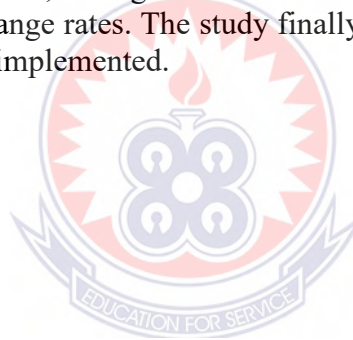
Log-DS - Log of Debts Services

Log-GDP – Log of Gross Domestic Products



## ABSTRACT

The empirical literature on volatility in exchange rates and its impact on terms of trade is expanded upon in this study, considering the role of institutional quality. The research employs GARCH and PARDL techniques to analyse data on member countries of the Economic Community of West Africa States (ECOWAS), between 2000 and 2021. The findings revealed past volatility in exchange rates has a significant predictive power on current volatility. However, the relationship between inflation and exchange rates differs between non-francophone and francophone countries, with inflation acting as a positive driver in the former and a negative driver in the latter. The study also finds that most indicators of institutional quality, except regulatory quality, have a significant negative impact on exchange rate in the long run. Institutional quality, financial development, external debt, and debt services yield mixed results. Additionally, majority of variables in the interim are insignificant. The study highlights that the overall imbalance in terms of trade within the sub-region leads to currency destabilization and a subsequent reduction in aggregate GDP. In the short run, the impact of these variables is significant for oil-producing non-francophone countries, while oil-producing francophone countries do not experience significant impacts. Therefore, the study highlights on the urgency to implement appropriate fiscal control policy and focus on the dynamic patterns to ensure stability of the exchange rates. Also, strong institutions are needed in formulating effective policies to stabilise exchange rates. The study finally recommends that strategic value chain policies should be implemented.



## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Overview of the Study**

This study investigated the terms of trade, institutional quality and exchange rate volatility in the fifteen member countries of the Economic Community of West Africa States (ECOWAS); as this ensures economic development in the sub-region. This chapter gives a background of the study, including stating the problem, the purpose of conducting the study, objectives and research questions. The significance, scope, limitation and organisation of the study is also presented in this chapter.

#### **1.2 Background of the Problem**

Trading is known to be the commonest form of international activity which has played and continues to play a significant role in history of the world, via exports and imports. It is one of the initial foreign business activities in Africa as it also requires less efforts and risks to its stakeholders. Trade openness is very essential because countries cannot be self-reliant on their own resources and productions thus; they rely on each other to cater for their inadequacies; as a result of comparative advantage, economics of scale and specialisation (Suranovic, 2012). Trading activities provides new market opportunities for the local firms, improves production and innovation through competition. Therefore, trade has a crucial role in the development of economies. Trade is a vital catalyst for economic growth and poverty alleviation yet; Africa as a whole has not completely captured the growth-enhancing benefits of trade. As the population of West Africa increases massively with the accompanied economic development, the prospect to trade becomes enormous. However, trade and its openness may not necessarily promote growth and development of an economy.

Agriculture is the main economic driver of economies in West Africa as it is blessed with many human and natural resources which is among the world's largest unrestricted trade zone. These resources are exported as primary products to other countries and imports are relied upon, to make up for the shortfalls in the low production of mid or advanced products; this is conventional theory of trade. West Africa is the major global supplier of cocoa beans from Côte d'Ivoire and Ghana while Nigeria is the largest oil and gas exporter (World Bank, 2022). West African countries continue to trade primarily with their former colonizers and with emerging economies such as China. For instance, West Africa is the largest trading partner of Europe in sub-Saharan Africa and China is their largest trading partner (AFDB, 2022). However, trade in Services in West Africa is hampered by institutional, regulatory and infrastructural constraints.

The countries in the region have been relying on few primary products consisting of gold, cocoa, cotton and petroleum, for exports which are largely undiversified (Gammadigbe, 2021). This makes the countries vulnerable to global economic slowdowns and international price volatility; posing challenges on sustaining their economic growth. Thus, the economies have the potential to promote export diversification and higher value addition. There is prevalent poverty and low economic growth rates in most of these countries with their products being uncompetitive in the international market; though generally, there is a development in transport logistics and access to technological infrastructure, leveraged for expanded trade and economic transformation; which in effect ensures economic growth (World Bank, 2022). Economic realities in West Africa underscore the presence of spatial interactions in the socio-economic phenomena because these countries are geographical neighbours and belong to the same union thus; an economic problem

occurring in a country may also affect other countries closer to it (Kpombrekou & Wonyra, 2020).

Many African countries have trade policies which are well-versed doctrine of import-substitution industrialization, aimed at protecting the domestic market (Ngouhouo et al., 2021). Over the years, there has been the introduction of Trade Facilitation Agreement, the ECOWAS Customs Code, and Common External Tariff, ECOWAS Trade Liberalization Scheme, Trade Facilitation West Africa, and the current Africa Continental Free Trade Area programs are trade initiative policies to enhance the sub-region (USAID, 2022). These policies are aimed, to promote the use of domestically produced goods which unfortunately, has not been remarkably successful as there is high preference and perception of international goods and services. Already, ECOWAS has established a free trade area and adopted a common external tariff. As global production is growing, awareness is being created on conventional trade statistics which may give misleading outlook of the importance of trade to economic growth and income. Generally, data on African trade is idiosyncratic, inadequate and inconsistent. Trade flows are measured grossly, and the value of products may be miscounted which might not reflect reality. The assumption that exports generate equivalent benefit to the producing economy is relatively robust but does not exist any longer.

Innovations such as the use of internet and container ship has revolutionised supply chain management. Trade openness has further reduced regulatory barriers in key sectors of the global supply chain which is facilitating foreign direct investment (IMF, 2022). Therefore, the costs of trading in terms of exports and imports; has dropped due to the technological progress and policy reforms. Foreign currencies have a vital role



to play in balancing the terms of trade and their market is a substantial macroeconomic indicator of reasonable growth in the economy.

Exchange rate movement in the exchange market has implications on every economy. There will be pressure when the demand for foreign currency exceeds its supply of the country's currency. The instability of currency demand function led to the termination of the monetary aggregate policy (Driscoll, 1985); so, IMF and World Bank directives implemented the Economic Reform Program, which also led to the introduction of major fiscal reforms. Its purpose had been readdressing the economic growth of countries by targeting exchange rate, investment, trade, and other macro-economic variables with their terms. Economic experts argue that floating regimes may have damaging effects on the economy since countries use foreign exchange as a medium to purchase products and services in the global trading environment; thus, when the currencies become volatile, the problem of uncertainty arises (Bahmani-Oskooee & Gelan, 2018). Countries that adopt the fixed exchange rate have the duty of maintaining the rates by distributing and circulating their currencies to meet the demand and supply of the currencies in the market. Also, advocates argue that sustaining fixed exchange rate regimes is quite challenging; nonetheless, ensuring stability of the exchange rate and other variables boosts trade and opportunities internationally to enhance development (Osei-Gyebi, 2021).

Sustained exchange rate volatility will lead to currency crisis; distort production patterns, and sharp fluctuations in external reserve. International trade is based on foreign currency, while foreign exchange risks originate from currency uncertainty, depreciation, and unavailable currency. Volatility in exchange rate affects the international exchange of commodities; as it increases the instability and susceptibility of the trade market. The effectiveness of a foreign exchange market and determining currencies are foundational responsibilities of both export and import oriented countries. Exchange rate instability is a major economy challenge because it

causes uncertainty in international trade and affects competitiveness. Despite efforts to stabilise exchange rates through central bank interventions, currencies are still experiencing significant fluctuations in its value. Unpredictability of an exchange rate has a significant adverse influence on trading activities, particularly, because most West Africans depend on imports and there is high prohibitive cost of exporting. Stabilising a currency in relation to the value of another currency reduces uncertainty of international trade and ensures that the currency reflect the underlying economic rudiments of the countries. These are of optimum importance to all stakeholders. Therefore, exchange rate volatility control policies are necessary to promote trade and economic stability. Hence improved macroeconomic management can help reduce exchange rate volatility.

Trading however is affected by unforeseen issues which can be domestic or global creating distortions in the general pattern. The global fiscal crisis of 2008 resulted in a sharp decline in world trade, where African exports performed less poorly than global exports while its imports also declined faster than global imports (WTO, 2010); such is the occurrence of the outbreak of covid-19 and the war between Russia and Ukraine. These events cause substantial variations in the volumes and structures of trades among the countries by limiting the operations of transportation and complicating trading activities globally (OECD, 2020). China is among the biggest trade partner of European countries and among the top ten trading partners of many African countries while Russia and Ukraine are ranked among the major global exporters of agricultural commodities, extractive resources, and others (UN Comtrade, 2022).

Therefore, trade and exchange rate policies are essential enabler for economic growth; as it ensures job creation, increases the availability of products options, allows extension of market beyond the local markets, and reduces poverty for countries. Enhancing the regulatory environment will help spur the growth of trade by encouraging innovation; ensuring financial stability and economies of scale. Therefore, quality institutions guarantee the appropriate facilitation of trade, consequently encouraging policies that stimulate volatility of foreign exchange on trade and attract the required revenues. The trade deficit of countries has negative connotations. West Africa countries seem to be unceasingly vulnerable and dependent on external economies by way of trade, which impends monetary and fiscal independence of their central banks so there is the need to brace efficient policies. Only exports are not sufficient to generate enough foreign exchange reserves for the countries; thus, policymakers are keen in fashioning appropriate policy in addressing the problems.

These disruptions have negative consequences for trade as it has asymmetric effects on exchange rate volatility and volume of trade. These occurrences have induced shock posing trade deterioration and rising inflation. There is the need for institutional control and quality to ensure the implementation of appropriate policy and interventions to secure an enabling environment to shape such trading activities to obtain the optimal benefits for development. West African countries struggle with large trade deficits, lack of competitiveness in the export sector, high demand for imports and flexibility of the exchange rate which contribute to the trade imbalance in the sub-region (World Bank, 2022; IMF, 2020). Generally, the aggregate trade balance of some African countries would have been in deficit if not for the extractive resources like crude oil. According to data available on WDI (2022), most of the

countries in the West Africa sub-region have higher value of imports than exports and this makes the exchange rates susceptible to external shocks and fluctuations. There is poorly diversified trade in West Africa, and this is not conducive to economic transformation and development (World Bank, 2022). There is persistent trade imbalance, which is a concern for economists and policymakers, as it affects the balance of payments, employment, and competitiveness.

Meanwhile reports from ITA (2019); UNCTAD (2020); suggests that West Africa is heavily reliant on revenues from their exports for economic management as this provides foreign exchange to fund projects and further opened up the economies. There are only two types of exchange rate system regimes operating in West Africa; the pegged rate and the floating regime. It is imperative to remember that the Francophone countries use the West Africa CFA, which is pegged, while the non-francophone countries have floating exchange rate regime. Also, the French former colonial economies appear to be compelled to trade mainly with France. The African domestic markets are highly dollarised hence its appreciation exerts pressure on the value of the domestic currency. This also causes problems in loss of country revenue, inability to be lender of last resort and relinquished ability to conduct monetary policy (Park & Son, 2020).

ECOWAS is a commodity-intensive economy where the terms of trade are more prone to shocks; posing risks on exports and imports because of the relative price inelastic and high volatility. The degree of exchange rate instability has significance over the stability of a country's trade and external environment. Exchange rates are main economic policy tool in universal trade that manages balance of trade because it affects a country's trade flows. The emergence of foreign exchange black-market has

been attributed to basic inconsistency between past fiscal and exchange rate policy. So, there is disparity between demand and supply of foreign exchange in official channels and variation among the official and parallel markets. This worsens the balance of payments problems, as the informal market is allowed to play a vital role in determining the rates; thus, aggravating the predominant foreign exchange crisis. Fluctuations in West African exchange rates are credited to high debts, adverse weather conditions, tightening in financial conditions, rising risk of debt distress, etc. (World Bank, 2022).

Trading without effective control and supervision will not yield best returns, so strong autonomous institutions are desired (Lin & Fu, 2016); as emerging economies have underscored external shocks as the prime source of aggregate fluctuations. The supply and demand of foreign exchange requires constant supervision. Information plays a unique role in predicting exchange rate. Institutional quality is improved to ensure efficiency and transparency of government institutions and regulations; to promote the rule of law and reduce corruption (Gammadigbe, 2021). This increases investor confidence, attracts foreign investment, and enhances competition, as it removes biases caused by information asymmetry (Ozpolat et al., 2016). Regulatory reforms aimed at promoting trade facilitation are needed to ensure well-functioning exchange rate regime and help access the full benefits of trade. Trade and suitable fiscal structures are tools for enhancing growth and reducing poverty.

Achieving and maintaining strong institution is a major issue of concern for African countries as there are challenges in managing institutional quality, political instability, corruption, and rule of law which hinders competition and growth. It is a fundamental area of discussion and policy focus for developing countries to strengthen their

institutions. The quality of institutions is an important basis of trade and economic growth as it plays a critical role in promoting financial development, trade and economic growth which is necessary for sustaining economic development. Accordingly, institutional intervention is needed to influence exchange rate; provide liquidity and monitor foreign reserves. A failure of institutions can distort the smoothness of a country's trade and cause instability of local currency and macroeconomic variables (Zhuang et al., 2021).

Currencies may be sensitive to trade but there is fairly little evidence on how reactive trade is to currency movements. Risks related with fluctuations in exchange rates may be unfavourable to trading, as it increases transactional costs and affects distribution of resources. A volatile exchange rate affects the economic development of a country as it influences prices and international trade because its increased uncertainty has income and substitution effects. It appears there is an interconnection between exchange rate, trade, and the quality of institutions.

### **1.3 Statement of Problem**

There are many studies contributing to literature on trade and institutions (Doan, 2019; Gold & Rasiah, 2022; Zhuang et al., 2021). Likewise, are research on the link between exchange rate volatility and trade (Bahmani-Oskooee & Aftab, 2018; Dada, 2018; Bahmani-Oskooee & Arize, 2020; Asteriou et al., 2016). Rajković et al. (2020), examined the relationship between the real exchange rate and the foreign trade imbalance in the Western Balkan, Central and Eastern European countries by applying feasible generalized least squares method whereas, Dada (2020) examined the effect of asymmetric structure inherent in exchange rate volatility on trade in sub-Saharan Africa using generalised autoregressive conditional heteroscedacity (GARCH) and

generalised method of moments (GMM). Also, Ngouhouo et al. (2021), analysed the determinants of trade openness in Sub-Saharan Africa countries focusing on the role play by domestic institutions using, the generalized methods of moments but Duodu and Baidoo (2020) considered the role of quality of institutions in assessing the effect of trade openness on economic growth of Ghana by applying autoregressive distributed lag (ARDL).

The analysis of empirical literature on the link between the terms of trade and exchange rate considering the quality of institutions seems to be limited in West Africa and empirically inconclusive. Thus, conducting such a study holds significant empirical relevance as the terms of trade have a direct impact on a country's economic performance. Understanding how changes in the terms of trade influence exchange rates is crucial for policymakers, businesses, and investors in West Africa as it allows for a deeper understanding of the region's economic dynamics. Additionally, the quality of institutions plays a pivotal role in shaping economic outcomes and policy effectiveness. This provides insights into how fluctuations in prices, which heavily influence the terms of trade, affect exchange rate movements and the overall macroeconomic stability, as institutional quality influence the transmission mechanism from terms of trade to exchange rate adjustments. Understanding the interplay between terms of trade, exchange rates, and institutional quality can inform policymakers on the potential implications for trade policies, exchange rate management, and institutional reforms. Ultimately, the study's findings can contribute to evidence-based policy formulation and enhance the region's economic resilience in the face of external shocks and global market dynamics. This study looked at whether institutions are effective in their role to check exchange rates with regards to trade.

Thus, this present study incorporated the quality of institutions into terms of trade and exchange rates and groups the countries in West Africa because it is relevant to consider the exchange rate regimes and economic capacity, as these may have bearing on the degree of variability of the countries' currencies. The motivation of this research was to aid bridge the empirical gap by establishing the moderating role of institutional quality on trade and exchange rates in member countries of Economic Community of West Africa States (ECOWAS).

#### **1.4 Purpose of the Study**

The study provided empirical evidence, by examining volatility in exchange rates and the influence of exchange rates on terms of trade while considering the role of institutions quality on such trading, from an academic scientific perspective. It examined the interplay between these factors and how they impact countries in West Africa, thus aid to gain a deeper understanding of the relationships.

#### **1.5 Objectives of the Study**

The specific objectives are to:

- 1 Examine the drivers of exchange rate volatility in the ECOWAS.
- 2 Investigate the effect of the exchange rate regimes on fluctuations of exchange rate in the ECOWAS.
- 3 Evaluate the moderating role played by institutional quality on the relationship between the terms of trade and exchange rate in the ECOWAS.
- 4 Assess the moderating role played by institutional quality on the terms of trade and exchange rate considering exchange rate regimes and economic capacity in the ECOWAS.



## **1.6 Research Questions**

- 2 What are the drivers of exchange rate volatility in the ECOWAS?
- 3 What is the impact of exchange rate regime on fluctuations of exchange rate in the ECOWAS?
- 4 What is the role of institutional quality on the terms of trade and exchange rate in the ECOWAS?
- 5 What is the role of institutional quality on the terms of trade and exchange rate considering the countries' exchange rate regimes and economic capacity in the ECOWAS?

## **1.7 Significance of the Study**

The study examined how the exports and imports as terms of trade; interacted with currencies and its mitigating measures by the role of institutions in the ECOWAS because of the potential impact that these factors can have on any country. Understanding the interplay between these variables provides valuable insights for institutions, policymakers, and analysts.

Consequently, the study is of significant help to West Africa's institutions, governments, and policymakers to pursue effective and appropriate agendas for economic development. This thesis serves as a critical guide for students and researchers alike to conduct further related work on the topic.

## **1.8 Scope of the Study**

The research focused on the fifteen member countries of ECOWAS, between 2000 to 2021 period by using annual data from IMF, World Bank, and yahoo finance. The study used variables which are the terms of trade, institutional quality, financial development, external debts, debts services, GDP per capita, inflation and exchange rates in estimating the GARCH and PARDL techniques. These extracted numeric data

were used to analyse how the relationship between the term of trade and exchange rate is influenced by institutional quality in the sub-region; thus, this aids to understand the dynamics of the factors involved.

### **1.9 Limitations of the Study**

Focusing on only West Africa limits the findings of the study to be specific on West Africa so, conclusions drawn cannot be generalised on Africa. Also, the study considered the US dollar against the various ECOWAS national currencies which does not give a view on the other major currencies. The US dollar was used because it is the highly traded currency in the international market. Another limitation was the financial development index was not generated by the researcher but was obtained from IMF which is reliable.

The member countries in ECOWAS have diverse capacities in terms of their trade, political contexts, and institutional quality; as the economic management systems is not similar. Thus, this study factored in the variations into consideration.

### **1.10 Organisation of the Study**

This research is categorised into five major chapters. The first chapter introduces the study by highlighting the background of study, statement of problem, purpose of the study, research objectives and questions by the researcher, significance of the study, scope of study, limitations encountered, and organization of the study. The second chapter reviews literature on similar studies. The review includes theories, empirical studies, views of other authors and concepts. The methodology and procedure adopted in carrying out the study are discussed in the third chapter. The fourth chapter presents and discusses the findings of the study. The final chapter summarises the results and draws conclusions. Also, suitable recommendations are given in the final chapter.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Introduction

Numerous studies have done and debated on the relationship of exchange rates, inflation rates and interest rates with national setting. The determinant of exchange rate volatility depends on market-related structural dynamics, and this is not a statistic, consequently it is difficult to measure the frequency of volatility (David et al., 2016). Trade when is associated with openness and freedom, it surges the overall productivity of a country, the efficient allocation of resources, and the resourcefulness of these resources. However, one aspect that has not received much attention in terms of performance is the effect of institutions as institutional factors have a marked effect on economic progress (Perugini & Pompei, 2017; Lin & Fu 2016) as trade protection reduces individual income.

The links between institutional quality, governance and trade are topics that require further research as the literature in this area is generally scarce. Policymakers are still struggling to determine what factors that are influencing exchange rate volatility, and researchers are yet to determine their real impact on trade. The findings of this study contribute to literature on this issue and will be important for the countries and policy makers to achieve economic development.

#### 2.2 Theoretical Review

Sub-Sahara is seen to be among the worst vulnerable, impoverished, debt-distressed, technically handicapped, and side-lined continent where there are wars, poverty, collapsed countries and failed economic reforms, and the West Africa may not be exempted from this description (IMF, 2020). Hence, trade is seen as a way of

economic growth and food security as West Africa has enormous potential for trade because of its natural resource endowment, agricultural potential, and intra-regional complementarities. Several philosophies have been compiled to explain trade, exchange rate and institutions. These developed concepts have been practiced over the years and they are explained below.

### ***2.2.1 Trade- Related Theory***

#### *2.2.1.1 Comparative Advantage Theory*

David Ricardo introduced the theory of comparative advantage that states that countries can trade even if they have a comparative advantage in the production of a particular good (Bernhofen & Bown, 2018). The theory of comparative advantage assumed that increased economic productivity provides better factors, namely capital, land, labour, entrepreneurial skill, strength, resources, technology, etc. to produce goods on a larger scale. In fact, the country must specialize in the production and export of those goods and services that it can produce more efficiently, that is, at a lower opportunity cost than other goods and services that it must import.

This theory is fundamental in international trade, since it reinforces the concept that countries should specialize in areas in which they have a comparative advantage. Wang and Zhang (2021) argue that an increase in the annual growth rate helps to achieve economies of scale in the production of certain commodities, which increases exports and thus improves international competition in the market. West African countries are natural partners for natural resources, agriculture and food trade, as different countries have different comparative advantages, with diverse ecosystems producing a wide range of products. There are natural complementarities between countries due to agro-climatic conditions that help promote large agricultural trade

flows. The theory promotes free trade as the best global policy where, a country specializes in producing goods that it has efficiency in producing than others, and then imports those goods that it can produce less efficiently.

West African countries have advantage in geographic location, climate, natural and human resources, but are at a disadvantage in terms of technological expertise and financial muscles. The countries in the sub-region have different advantages in natural resources thus; with this theory, countries specialise in producing and exporting products based on their endowment of resources. The concept is especially important in international trade, suggesting that countries should specialise in areas in which they have a comparative advantage. In international trade, each West African country takes to the production of only those products; they are advantaged in, as compared to the other countries. Thus, with international specialisation, each country concentrates on the making of only such products in which it has the maximum comparative advantage and the least comparative cost.

Therefore, the pattern of exports shows a large extractive product such as oil, crude oil, natural gas, and agricultural staples such as cocoa, rubber, and cotton. While the pattern of imports is more diversified, with a high share of industrial products such as refined oil, vehicles, ships, communication equipment, and food products such as rice and wheat. Basically, raw materials are sold to others and industrialised products bought into the region. In a nutshell, nations specialises in the production and export of commodities on which they have comparative advantage and then imports commodities on which they are comparative disadvantage as no nation can produce and absorb every commodity by itself; such trades ensure the efficient utilization of resources, thereby leading to economic growth (Fofanah, 2020).

## ***2.2.2 Theories Related to Exchange Rate Volatility***

### ***2.2.2.1 Marshall Lerner Condition***

An approach to elasticity of the relationship between exchange rates and trade balances is the Marshall-Lerner (ML) condition (Marshall, 1923; Lerner, 1944). The Marshall-Lerner condition describes the circumstances under which a change in the exchange rate of currency leads to an improvement or deterioration in that country's balance of payments (Anning et al., 2015). Thus, the devaluation of a country's currency favours a country's trade balance if the sum of the absolute values of the price elasticities of a country's imports and exports is greater than one. When the ML condition holds, the exchange market is implicitly stable since there will be excess foreign exchange when the exchange rate is above the equilibrium, and vice versa. The ML condition is a long-run equilibrium condition empirically investigated by understanding the response of the imports and exports in level variables to changes in exchange rate.

The trade balance of a country is determined by subtracting the absolute value of imports from the absolute value of exports. So, in West Africa, with currency depreciation, export price fall while the volume increases. Meanwhile, import prices increase with its volume decreasing. Import and export volumes respond appropriately to offset the deterioration in prices. In other words, the impact of exchange rate devaluation on the trade balance is related to the determinants of the elasticity of supply and demand for imports and exports. In the interim, there is inelasticity of supply and demand than in the long term (elastic), so the trade balance may deteriorate in the short term. The sum of the absolute price elasticities of exports and imports must be greater than one to affect currency devaluation likely to improve a country's trade balance.

Mathematically the Lerner Marshall condition is derived as follows:

$$\text{Surplus} = (X \text{ tons}) * (\$/\text{ton}) - (M \text{ tons}) * (1\text{ECO} / \text{ton}) * (\$/\text{ECO})$$

Where  $X = \text{Exports}$

$M = \text{Imports}$

$e = \text{price of foreign currency in terms of domestic currency}$

$\text{ECO} = \text{national currency of the member states of ECOWAS such as } \mathcal{C}, \mathcal{N}, \text{ etc.}$

This is simply stated as

$$\text{Surplus} = X - eM$$

Derivative surplus of exchange rate (e)

$$\frac{d\text{Surplus}}{de} = \frac{dX}{de} - e \frac{dM}{de} - M$$

Multiplying and dividing by M

$$\frac{d\text{Surplus}}{de} = M \left( \left[ \frac{dX}{de} \frac{e}{X} \right] \frac{X}{eM} - \left[ \frac{dM}{de} \frac{e}{M} \right] - 1 \right)$$

It can be rewritten in terms of the elasticities of demand of exports and imports,

$$\frac{d\text{Surplus}}{de} = M \left( \epsilon_x \frac{X}{eM} \epsilon_m - 1 \right)$$

Subtract and add eM to the numerator of the first term

$$\frac{d\text{Surplus}}{de} = M \left( \epsilon_x \frac{X - eM}{eM} + \epsilon_x - \epsilon_m - 1 \right)$$

If the value of exports minus imports equals zero so the trade surplus is  $X - eM = 0$ ,

the last equation simplifies to

$$\frac{d\text{Surplus}}{de} = M(\epsilon_x - \epsilon_m - 1)$$

So, the trade surplus rises if the absolute values of the two elasticities add to more than 1, which is the Marshall-Lerner condition.

Marshall-Lerner conditions are long-term conditions because they give exporters and importers ample time to adjust to the exchange rate fluctuations by providing alternative supply and demand options. The reason behind using the Marshall-Lerner

condition is to find whether the forex market is stable or volatile. It is difficult to determine the exact shape of the supply and demand curve of the forex market, so it is problematic to determine the stability of the forex market. Currency appreciation occurs through an upward movement, while a downward movement indicates a loss of value (depreciation) against the foreign currency (Anyanwu et al., 2017).

Critics argue that devaluation reduces the real value of traded and non-traded goods, thus improving the balance of trade and balance of payments. The effect of exchange rate uncertainty on exports depends on the degree of risk aversion. The Marshall Lerner condition holds when exporters do not amend the price of their products, following an appreciation or depreciation of their domestic currency. If firms do not attempt to retain their market share, foreign currency-denominated prices entirely incorporate the change in the exchange rate. As a result, any currency depreciation or appreciation fully affects cross-country competitiveness of products.

This condition is important in West Africa as the sub-region is developing with persistent deficit balance of payment. Thus, depreciation of the exchange rate that would reduce such deficit is critical because exports from the region are raw materials which are low price elasticities while imports are industrialised. These are assessed with the high inflation rate linked with the movement in exchange rates to obtain any benefits of trade to ensure growth in the economy. However, extractive resources such as crude oil exhibit a higher elasticity. Although the MLC is sometimes regarded as a useful approximation, it lacks generalizability.

#### *2.2.2.2 Purchasing Power Parity Theory*

Proposed by Cassel (1918), the theory of purchasing power parity (PPP) has long had a prominent place in international economics. PPP is the theory suggesting that the



exchange rate between currencies is balanced when the purchasing power of both countries is the same. PPP naturally assumes that there has been no change in the conditions of international trade during short-run period that would alter the equilibrium level of the exchange rate (Gailliot, 1970); meaning that the exchange rate of the two countries must be equivalent to the proportion of the price levels of the two countries to a fixed basket of goods and services. Accordingly, there are two types of PPP; which are the absolute and relative PPP. Absolute PPP is when the value of local and foreign currencies is equivalent in the ability to buy a specific amount of goods and services when currency is converted.

Meanwhile, when equivalent amount of goods and services are bought after adjustment of inflation is termed relative PPP. PPP is regarded as a better indicator of the strength of a country's currency than exchange rates. World Bank (2013) defines PPP as a representation of the number of currency units required to purchase the amount of goods and services which can be bought with one currency unit of the base or reference or numeracies country. The logic behind PPP is explained by the law of one price, as it states that the prices of globally traded commodities must be the same everywhere by expressing it in a mutual currency (Ang et al., 2021).

Therefore, the domestic price must be equal to the foreign currency price in the foreign market. It is used as a measure of the standard of living, competitiveness and to determine the trade flows of a country. Exchange rates should be used to align the prices of products in different countries, as the purchase price parity theory predicts. So, based on parity theory, the value of a country's currency relative to another is determined by the prices of related products in those countries (Camilleri et al., 2019). However, a general price level can represent the purchasing power of money in a

country and that price measures limited to traded goods (exports and imports) are unsuitable.

It is argued that higher exchange rates result in higher import costs and lower foreign trade for risk adverse traders. Indeed, the exchange rate is agreed in the commercial contract, but the payment is made on delivery. As a result, exchange rate fluctuations become unpredictable, leading to uncertain profits, and potentially reducing profits from international trade. This increases the importer's risk and leads to currency risk. Increased financial development has been identified as a factor to increase exchange rate volatility. Economic freedom and the removal of exchange controls lead to large fluctuations in exchange rates.

West Africa's overall trade balance is positive thanks to crude oil, gold, etc., but then the food trade balance is facing a negative trend and rapidly deteriorating year on year. This creates a paradoxical situation where the region with extremely high food production potential imports more food. This movement is explained by the increase in the purchasing power of the countries of the region due to the boom of commodity, the rapid increase in the population to be fed and the evolution of consumption patterns linked to the strong movement in urbanization and the rising of the middle class. Dependence on food imports is increasing due to growing and changing demand for food that cannot be met by adequate domestic food supplies. Actual price indices are calculated from individual prices of only a sample of commodities rather than all commodities in the economy; therefore, any computed price parity is an imperfect representation of the true theoretical parity.

With regards to West Africa which is not industrialised, the CFA users, which is pegged to the French franc and euro at a fixed rate shows evident of PPP; and the

non-CFA users shows that PPP does not hold continuously. Thus, exchange rate movement has a larger effect on the non-CFA countries than in the CFA countries. Generally, exchange rates influence prices of goods and services. This is because, adjustment in exchange rate causes price differentials over time arising from the different economic policies. Thus, PPP is supporter for long-run exchange rates. Changes in exchange rates are unpredictable, create uncertainty about the profits and hence reduces the benefits of international trade.

### ***2.2.3 Institutional Related Theories***

#### ***2.2.3.1 New Institutional Theory***

Institutional theory has a deeper and more resilient aspect of social structure. It looks at the processes of building structures; rules, norms, and routines, to become established as an authority guideline for social behaviour. Also, it considers how such elements are created, diffused, adopted, and adapted time; plus, how they fall out of use. Institutional theory is the dominant theory of any organizational environment relations (Glynn & D'Aunnoan, 2020; Aksom & Tymchenko, 2020). The resurgence of institutional theory in the 1970s began with investigations of the effects of institutional contexts on the structures of organizations (Meyer & Rowan, 1977). The foundations in institutional theory laid down are phenomenology and ethnomethodology.

Institutions are essentially cognitive constructions that control social action independent of any form of sanction. Ethnomethodology investigates the nature of practical knowledge; the implicit background knowledge people employ in daily interactions. According to a study by Glynn and D'Aunnoan (2020), institution is a distinctly established social sort whereas institutional theory is a theoretical

framework for analysing social phenomena, which views the social world as significantly comprising enduring rules, practices, and structures that set conditions on action. Institutions are fundamental in explaining the social world because they are built into the social order, and direct the flow of social life; so, they are the constants that determine the rules of variation. Also, Forson et al., (2021) conceptualised institutions on two key understanding being the entity itself and the practice of the law.

Institutions influence action because departures from them are automatically counteracted by social controls that make deviation from the social order costly. These controls associate nonconformity with increased costs, increased risk, greater cognitive demands, or a reduction in legitimacy and related resources. Meanwhile, North (1990) saw organizations as players and institutions as rules that define how games are played. Institutional theory also argues that the reality of scarce information can impede the efforts of any nation. Thus, information is explicitly treated as a variable that can be influenced by human action, so it focuses on improving the informational environment. However, institutional theory maybe narrow and ignorant to issues of agency, changes, and heterogeneity (Oliver, 1991; Scott, 2008). Economic historians have largely underscored the role of institutions in the process of economic development (North, 1990).

The new institutional broadens the scope of neoclassical theory, shows that institutions are the basis of the efficient functioning of market economies. Poor institutional development can complicate the development of new businesses; whiles, a more developed and overly regulated institution can hinder activity. North (1993) suggests there is institutional dependency due to the presence of network externalities, economies of scale, and complementarities in each institutional environment.

Organizations gain bargaining power within the framework to have a decisive interest in perpetuating the system. Although the role of institutions has not yet been formalized as part of a coherent economic theory, institutional theory is gradually increasing in popularity. Institutional dynamics are not static, including the interaction between the economic and political sector.

According to Meyer and Rowan (1977), with institutional theory; organizations that respond to institutional pressures may disregard their organizational framework of operations, leading to misalignment between policies and the reality on the ground. By complying with institutional demands, organizations may compromise, avoid, disobey, or manipulate (Oliver, 1991). Institutional theory states that organizations integrate normative and cognitive norms through four types of mechanisms: coercive, that is, imposed by government or public regulations; mimetic, that is, an exact copy of what others do which reflects uncertainty and peer pressure; normative, that is, it responds to the rules and regulations for obtaining standards and certifications; and the competition, that is, the ability to be innovative (DiMaggio & Powell, 1983).

Therefore, the new institutional theory focuses on elaborating of rules and beliefs (de Grosbois, 2015) along with the broader environment of the organization, and at the same time raises awareness of the need for organizations to comply with institutional rules and norms to legitimize their existence (Meyer & Rowan, 1977; DiMaggio & Powell, 1983) and the identifying higher initial incidence of market flaws in an economy. A study by Forson (2016) showed that this theory is an improvement of the old theory to fill in its gaps by focusing on both external and internal factors. However, it abandons the supposed instrumental rationality but retains the basic assumption of scarcity because human beings are cognitively limited. This imposes a

constraint on human interaction to structure the exchange. Moreover, Oliver (1991) suggested three sources of pressure on the institutional base which include functional, political, and social. Functional pressure arises from perceived problems with practices' performance levels. These pressures may be related to broader environmental changes, such as intense competition for resources.

Thus, North (1993) suggested that institutions are known for their ability to reduce uncertainty in human exchange and are critical determinants of efficiency; such that Anderson and Young (2000) showed that the inability to enforce contracts can act as a tariff that reduces trade for risk-neutral traders. Similarly, Rodrik (2002) notes that the main obstacles to international trade are the enforcement of contracts. Corruption is a central barrier to trade in West Africa. When the institutional structure works properly, it reduces transaction costs, uncertainty, and risk, so weak structures can limit development. For a developing economy such as this, to benefit from trade, quality institutional is extremely important. It can be said that trade provides opportunities for economic growth and development, but this is not guaranteed; institutions through strict policies implemented by government create an enabling environment to ensure better results and positive benefits from such trade activities.

The quality of the institution guarantees independence, and strategies for building and improving economic infrastructure; build production capacity, develop appropriate regulations and effective business infrastructure to create a more competitive and developed economy. The introduction of the aforementioned foundations required the researcher to experimentally verify the credibility of these theories in West African countries.

## 2.3 Empirical Review

### 2.3.1 Trade and Institutional quality

Baltagi et al., (2009) argued that free trade promotes institutional regulations that ensure financial control while openness to trade ensures financial development. However, the contributions to financial development in countries that are agricultural commodities export driven are more limited than for countries that import production-based goods. Zhang et al. (2019) suggested that the inadequate appropriate innovation measures might create barriers in trade as it increases the universal competitiveness of any country. International trade has increased significantly over the years because of reductions in shipping and communication costs, negotiated reductions in tariffs, the widespread outsourcing of production activities, and greater preference for foreign products (World Bank, 2022). Zahonogo (2017) used a dynamic growth model covering the period 1980-2012 to study the impact of trade openness on economic growth in developing sub-Saharan African countries. The analysis showed that there is a trade opening threshold and concluded that some policy considerations are necessary to strengthen the impact of trade openness on growth in sub-Saharan Africa.

Sharma et al. (2019) found a relationship between government shutdowns and exchange rate volatility, stating that government shutdowns tend to increase exchange rate volatility, which makes the global economy and trading activities to have a negative impact on trade. In their study, Ngouhouo et al. (2021) pointed out that institutional quality, government effectiveness, regulatory quality and rule of law as composite indicators improve trade openness; so, there is the need to improve the quality of institutions in detailing international trade agreements. Duodu and Baidoo (2020) examined Ghana's trade openness, considering institutional quality from 1984 to 2018. Short- and long-run estimates from the ARDL model suggest that trade openness

and institutional quality have significant positive effects on the economy. The effect of the interaction between the two variables is negligible. An economy with inefficient institutions does not have the capacity to react aptly to external shocks, which results in slower long-term economic growth (Rodrik, 1999).

Institutional quality plays a significant role in promoting economic development (Akpan & Atan, 2016; Doan, 2019). The Pacific 2020 Report (2006) published by the Australian Agency for International Development highlights the need to invest in institution building for long-term growth and development. It revolves around four main axes: economic growth, sustainable development, good governance, and security through regionalism. Anderson (2001) suggested that institutional dysfunction negatively affects foreign trade, as it increases both the costs and the risks of foreign trade. Other work by Anderson and Marcouiller (2002) provides empirical evidence of the impact of institutional quality on trade, showing that poor institutional quality reduces external demand. It has been pointed out that there is a positive correlation between institutional quality and openness, and that there may be a two-way causal relationship between the two variables (Dollar & Kraay, 2002).

Monetary policy is a key determinant of formation of global imbalances through the accumulation of reserves and changes in nominal short-term interest rates. Kuncic (2012) emphasized that countries that are similar in terms of economic institutions, trade more with each other. Zhang et al. (2019) held that inappropriate innovation measures can create barriers to international trade. Also, Tinta et al. (2018), scrutinized whether countries should develop strategies to increase international trade through greater openness, or policies to enhance regional and regional trade through potential value chains under regional integration. Their study suggested that



international trade is not the best solution to promote the economic growth of ECOWAS countries, but regional trade linked to value chains addition is the best solution.

A study by Sekkat and Varoudakis (2002) also examined the relationship between trade policy reforms and the share of manufacturing exports in GDP in the Middle East and North Africa (MENA) and found that trade policy had an impact on regional performance. Furthermore, Meon and Sekkat (2004) showed that poor institutional quality in MENA countries is linked with mediocre performance of manufacturing exports and attractiveness of foreign direct investment. This result was confirmed by Achy and Sekkat (2003) in examining the effects of exchange rate policies. Anyanwu (2016) identified the main drivers of inequality for a panel of 17 West African countries, including foreign direct investment and trade liberalization. Similarly, Fosu (2018) pointed out that poor governance is the cause of high inequalities in Africa.

### ***2.3.2 Exchange Rates Volatility and Institutional Quality***

The disappointment of the Bretton Woods exchange rate system and the start of an economic recovery program which allows countries to freely choose the exchange rate agreements for their currencies, except to link the value of their currencies to the price of gold (IMF, 2009). This led to floating and fixed regimes adoption with increased interest on the effects of currency depreciation on the trade balances of developed and emerging economies (Marwah & Klein, 1996). Exchange rate regimes of emerging economies have evolved over the years. A review of exchange rate regimes by the IMF (1999) found that countries should adopt either government-controlled “hard” pegs or floating pegs, since simple pegs are prone to crises. When the market determines the value of a currency without government intervention.

According to the IMF (2009), pegged exchange rates to hard currencies were common in the early 1990s. To stabilize the economy after initial price liberalization, most countries transited from a command towards a market economy which have used fixed currencies more than hard currencies, but emerging countries have experienced a crisis in the balance of capital. Among macroeconomic impacts and exchange rate fluctuations, this is a principal factor influencing trade locally and universally.

Samuelson and Nordhaus (2001) showed that exchange rates are highly volatile in the short term since it's extremely sensitive to changes in central bank intervention, monetary policy, and expectations. And in the long term, it is affected by relative commodity prices. In a study, Dada (2020) noted the need to develop exchange rate policies that ensure the stability of exchange rate fluctuations in the region, and that the policies, as well as other appropriate policies that can increase national incomes, should be developed, and implemented. Econometricians and analysts have expressed concern that currencies significantly depreciate in many countries, affecting their competitiveness and intensifying national "currency wars" (Mantega, 2010). Exchange rates are described as the value of a currency against another (Raza et al., 2013). Exchange rate volatility affects domestic prices, which is a major concern for nations so has received so much attention (Yellen, 2015; Fisher, 2015; Forbes, 2015).

Sutherland (1996) found that exchange rates respond to shocks depending on the magnitude of international financial resistances and that the impact of financial openness depends on the type of shock the economy faces. Currency crises in emerging markets are becoming more regular and of particular concern when the exchange rates are highly volatile. Gabaix and Maggiori (2015) introduced a general equilibrium environment and shown that exchange rate intervention is effective

against exchange rate fluctuations. Foreign exchange intervention in a restricted borrowing environment is effective when restrictions are binding (Chang & Velasco, 2017). Cavallino (2019) uses a neo-Keynesian model to study the optimal exchange rate intervention for non-fundamental capital inflow shocks and characterizes the first-order solution for the steady countries. Amadore et al. (2020) illustrate that the exchange rate intervention needed to maintain a given exchange rate path in an environment with a zero lower bound on nominal interest rates and measure the cost of intervention in Switzerland as a covered interest rate parity deviation and the reserves stock.

### ***2.3.3 Trade and Exchange Volatility***

It has been argued that exchange rate fluctuations have a negative impact on exports, but some studies suggest that exchange rate fluctuations increase exports. Bahmani-Oskooee and Gelan (2018) used the ARDL model in a study investigating the impact of exchange rate risk on trade flows in twelve African countries. Exchange rate fluctuations can improve or worsen exports and imports, but in the short term the effects are more widespread (Senadza & Diaba, 2017). Using the Generalized Autoregressive Conditional Heteroscedasticity, Alper (2017) studied the impact of exchange rate fluctuations on Turkey's trade with fifteen European countries. Exchange rate fluctuations were found to reduce exports in the short term. However, the impact on the import sector will be both positive and negative eventually, as Turkey's trade with European Union countries is protected from exchange rate fluctuations.

A conclusion by Bostan et al (2018) is that exchange rates are an important determinant of competitiveness, but the impact of uncertainty on imports and exports

is different in Romania. However, the effect seems weak for imported products. In a study by Osei-Assibey (2017), using a more severe specification for the relevance of trade volatility between Ghana and its trading partners (US, UK, Europe, China, India, Japan and Nigeria); it was shown that in the absence of hedging services, exchange rate fluctuations had a large positive impact on Ghana's exports, but little impact on Ghana's imports. However, for total trade, the effect, although positive, was not statistically significant and then the short-term and long-term dynamics were not considered. Yussif et al., (2022) found that exchange rate fluctuations negatively affect the export performance of the Ghanaian economy, but the result does not establish a relationship between fluctuations and imports.

Diallo et al. (2017) found that the main influences on African exports were the exchange rate, aggregate import demand from partner countries, and the openness of the African economy, and concluded that imports from Africa were strongly influenced by the distance. Sidamor (2013) studied the effects of variables such as gross domestic product (GDP), distance, foreign direct investment, inflation, exchange rates and GDP per capita on trade flows between China and the SSA. Africa's GDP, GDP per capita and China's GDP were found to have a negative impact on volume of trade, while exchange rates and FDI had a positive impact. Mohsen (2015) used Johansen's cointegration test to study the impact of exports and imports on Syria's economic growth. Imports and exports were found have a positive and significant impact on GDP. Secondly, the Granger causality test also showed a bicausality between exports, imports, and GDP in the long and short run. This means that if there is a shock to exports, GDP will react positively for several years afterwards, but if there is a shock, GDP will react positively. A shock to imports would have a negative effect on subsequent GDP.

Import and export volumes are overly sensitive to exchange rate fluctuations. The extravagant taste for foreign goods and services is cited as a major contributing factor to the decline of the Ghanaian cedi (Arthur, 2010). Exchange rate changes reflect prices and volumes based on export pricing models. The assumptions underlying exchange rate shocks are firm heterogeneity (Berman et al., 2012), distribution charges, importance of trade incorporation (Auer, 2015) and the import intensity of exports (Amiti et al., 2014), strategic complementarity, market structure (Amiti et al., 2016), inadequate information on competitors (Garetto, 2016) and invoicing currency choice (Gopinath, (2015). Iscan and Kaygisiz (2019) explored the relationship between inflation and interest rates in a study of Turkish exchange rates for the period 2009-2017. They found that the exchange rate is the cause of both inflation and interest rates. And there is a one-way relationship between inflation and interest rates. However, Oner (2018) was unable to find a causal relationship between inflation and exchange rates.

There seem to be an indicator showing that the cost of shipping containers is rising, and the cost of shipping bulk cargo has tripled. These increases are expected to drive up import prices, as domestic prices of imported goods increase in proportion to transportation costs, intermediate inputs create additional cost pressure on producers and pressure on domestic consumption to charge higher prices (IMF, 2022). This disruption includes negative spiralling effects on supply chains, obviously restrictions on major modes of transportation, border restrictions in many countries, and reduced activity in many sectors (Guan, 2020). The long-term impact of these is the global rise in prices of basic commodities such as food and fuel (United Nations, 2022), which remains severe, with numerous worsening economies to meet their Nationally Determined Contribution under the Paris Agreement (UNFCCC, 2021).

Chatelet et al. (2017) studied the impact of import prices on European inflation and found that industrial import price explains the subsequent pick-up in industrial consumer price inflation. Munepapa and Sheefeni (2017) studied the impact of imports on inflation in Namibia and found that although the impact was negligible in the short run, imports significantly increased inflation in the long run. Ahmed et al. (2018) studied the relationship between inflation and exports including imports in the Pakistani and found a positive relationship in the long run. A study by Dada (2020) again found that both positive and negative exchange rate fluctuations negatively affect business activity in Africa, but the magnitude of negative exchange rate fluctuations is greater than positive. This confirms the price stickiness of the exchange rate. Moyo and Khobai (2018) also explored the positive impact of trade openness on economic growth by analysing panel data using eleven countries from 1990 to 2016. The study disclosed that trade openness has a negative impact on long-term economic growth.

In their study, Roy and Bhar (2020) used a time-varying parameter model to explore the relationship between commodity export prices and fluctuations in the AUD/USD exchange rate by observing monthly data on a thirty-year period. They found that exchange rates are predictable because of commodity prices and that Australia's base metal index is highly correlated to the country's exchange rate. In Uganda, the findings of Tumwine (2018) show that the Ugandan exchange rate has a significant positive impact on the trade balance in the short run, but a significant negative impact on the trade balance in the long run. The results of this study also show that changes in the exchange rate are dominated by depreciation, so the short and long run are contrary to what the J-curve suggests. Bostan et al (2018) conducted a study on the impact of exchange rates on Romania's international trade competitiveness using data

from 2007 to 2014 and employed ordinary least squares (OLS) regression. Although exchange rates have been shown to be an important determinant of competitiveness, the impact of uncertainty on exports and imports is different. This effect therefore seems weak for imported products. Research of Atif et al. (2017) showed that the exchange rate is a driving factor for Pakistan's agricultural exports.

#### ***2.3.4 The Interaction of Financial Development***

Abaidoo and Agyapong (2022) showed that the quality institutions have positive impact on financial sector development, thereby accelerating the pace of financial development in sub-Saharan Africa. Focusing on the West African Economic and Monetary Union, Djeri et al. (2020) demonstrated that institutional quality influences financial development. These financial institutions play a vital role in financial development. Additionally, Ibrahim and Sare (2018) examined the determinants of financial development in 40 African countries and discovered trade openness and human capital are alternatives. It plays an influential role in the financial development of Africa. Aghion et al. (2009) found that exchange rate flexibility absorbs the effects of terms of trade shocks, although the overall impact of exchange rate flexibility on growth is negative for countries with lesser levels of financial development.

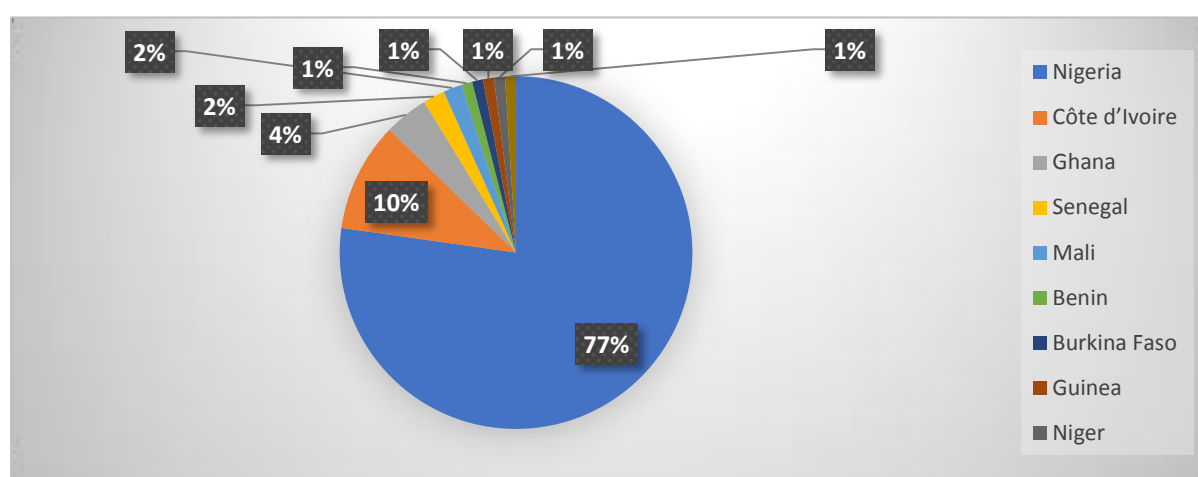
Biliretal (2019) studied the United States and found that strong financial development in countries stimulates globalization and foreign direct investment by multinationals; where Kandil et al. (2015) defines globalization as greater integration of economies through trade openness and financial flows. Chinzara and Hoveni (2015) discovered that financial openness significantly increases macroeconomic volatility in countries with high macroeconomic volatility, while reducing macroeconomic volatility in countries with historically low volatility. It can be said that instabilities intensely alter

trade and increase the hesitancy of Western consumers (Simchi et al., 2022), causing chaos in emerging economies, where there is low financial development and economic downturn. This sends shockwaves throughout the global economy thereby increasing economic disturbances.

Additionally, Rajkovic et al. (2020) demonstrated that during the global economic crisis, the real exchange impact on the current account balance is reduced. In a stable economic environment and a sophisticated financial system, the exchange rate is a powerful tool that can reduce trade imbalances. In this case, the depreciation of the national currency improves the trade balance.

Countries strive to improve aspects that contribute to good governance, which can lead to improved trade structures. This is important for emerging economies that aim for higher levels of growth. Due to the generally limited literature available in West Africa, the links between trade, institutional quality and exchange rate volatility remain unclear and require further research.

## 2.4 Trade Openness and Exchange Rate



**Figure 2.1: West Africa Regional Exports**

Source: ECOWAS (2022)



**Table 2.1 West Africa Regional Imports**

<b>Country</b>	<b>Share of Imports</b>
Nigeria	41%
Côte d'Ivoire	10%
Ghana	18%
Senegal	10%

Source: ECOWAS (2022)

Nigeria accounts for the highest exports, mainly because of its huge crude oil exports and large economy; they also dominate in huge imports as well. Ghana and Côte d'Ivoire also have huge exports and imports, largely due to cocoa and crude oil as seen in Table 2.1 and Figure 2.1.

For every country that desires growth and development, trading is important as this increases the market size thus, making more goods available in the local economy (Sharifi-Renani & Mirfatah, 2012). Internationally, trade is seen to boost the quality of goods and services, increasing the competition locally and internationally (Isik et al, 2018); through accessing larger global markets; transferring essential knowledge and expertise among firms. In this way, customers are able to access variety of products which are used to enhance standard of living. Policies that open an economy to trade globally are desirable for sustained economic growth. No country can achieve economic success without trade liberalization and openness because there are unequal natural resources and skills distributions among countries.

With this, more countries have embraced the idea of increasing trade by opening of their economies so trade openness has become a trend in this modern economics.

The ongoing regional integration connected with the African Continental Free Trade Area (AfCFTA) further supports positive trends and creates new opportunities to expand trade for development. Being open in trade is important for economic growth as it is an open trade policy of a country. The assumption that exchange rate fluctuations severely affect trade depends on unique conditions, especially where

there are changes in the other variables with exchange rates (Mohammed et al., 2021). These shows that exchange rate volatility is because of underlying shocks to the economy and policy regime determines how these shocks are transferred into exchange rates and other variables (Ameziane & Benyacoub, 2022). Global economic development has a direct and indirect impact on a country's trading and its volumes because countries are largely integrated into the global economy after the reduction of trade barriers by many countries. Trade is an important engine of integration which can diffuses economic disorders amongst countries.

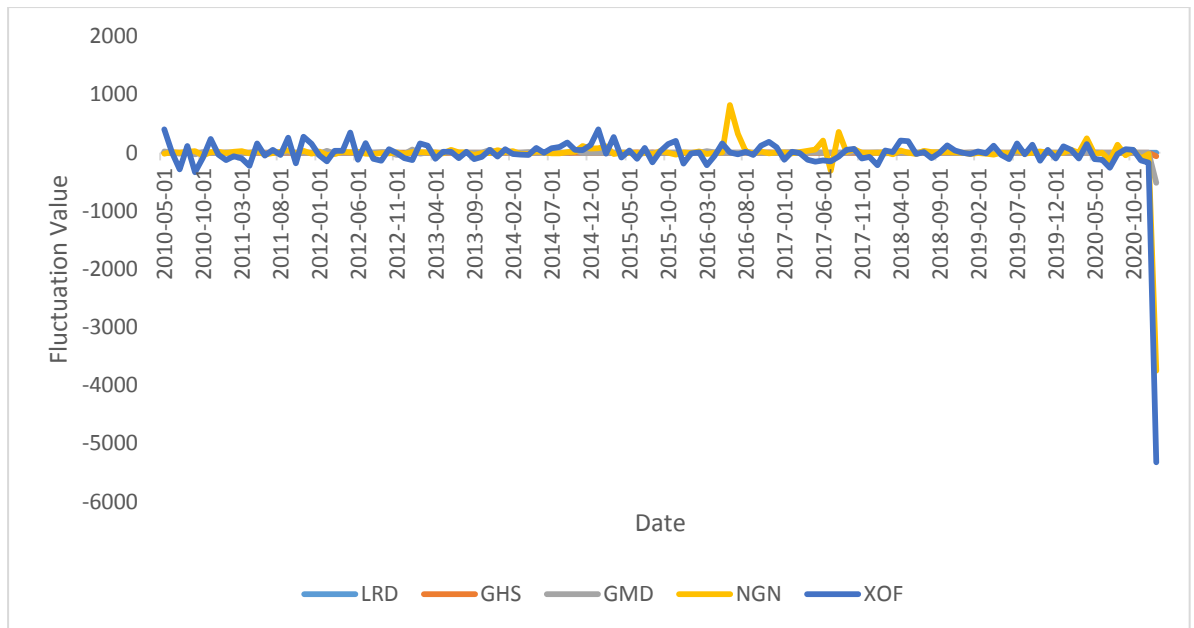
The lasting effect of the global fiscal crisis and the sluggish recovery of many developed and developing economies have weakened trading globally and have caused the reduction of global demand, particularly for commodity exports (IMF, 2022). Trading activities increases the openness of a country to international trades which is usually linked with high imports as in consumption and production thereby resulting in competitive prices due to pressure from foreign products. West Africa is challenged with the issue of limited production capacity; thus, the countries greatly depend on trade to make up for these inadequacies. It can be said that West African countries excessively dependent on goods and services from other countries. Imports play a critical role in offsetting the inadequacies of domestic supply and meet the ever-increasing demand for imported goods.

Exchange rates are mainly determined by the conditions of equilibrium between the demand for stocks in different national currencies and the stocks available in those currencies (Mussa, 1976). Trade is presumably negatively affected by fluctuations in exchange rates, so countries that are highly dependent on imports are likely to experience greater volatility subject to world prices. Fluctuations in various exchange rates can have an equalising effect on profitability. As world trade increases, the

impact of exchange rate fluctuations on world trade may decrease. The continued depreciation of the exchange rate casts doubt on the financial system, increases uncertainty, and leads to unexpected declines in personal income. However, an IMF review (1984) showed inconsistent results regarding the economic relationship between exchange rates and international trade.

Imports and exports create a gap between consumption and production. Krugman (2016) indicates that the real exchange rate is important in adjusting trade balance and has a significant impact on trade. Darku and Yeboah (2018) in their study, used initial income levels as a tool to investigate the relationship between openness and growth in Asian tigers and developing countries, and found that the relationship between trade openness and growth was like that of early income level tied to a specific country. Huchet-Bourdon et al. (2018) used the GMM estimation approach to investigate the relationship between openness and growth in an unbalanced panel of 169 countries over the period 1988–2014, with high-grade exports and kinds of exports as channels. used. They found a non-linear pattern in the effects of the growth of trade openness and concluded that the positive impact of trade openness on economic growth depends on the quality and diversity of the country's export basket.

Increases in exchange rate volatility due to domestic demand shocks usually result in insignificant pass-through ratios, reflecting the offsetting growth effects (OECD, 2021). This may lead to higher inflation and may also require frequent price adjustments to ensure profitability. This situation is associated with low growth and financial crises, as rising prices reduce investor confidence, discourage savings, weaken consumption, and undermine financial stability (Mishkin, 2008).



**Figure 2.2: Exchange Fluctuation of Selected West African Countries**

Source: Yahoo Finance and Researcher's Calculation.

Exchange rates are major determinants of global trade and require utmost attention as they cause imbalances associated with them (Alegwu et al., 2017). It can be seen in the figure 2 that various exchange rates of ECOWAS countries keep changing over the years. World trade is greatly affected by exchange rate volatility, or exchange rate misalignment (Moosa, 2000). It is well known that differences in exchange rates affect global trade as in, an overvalued exchange rate encourages imports. This will increase competitiveness in the globally and lead to an addition in domestic demand for imports due to the relative cheapness of foreign currency. However, the undervalued exchange rate reduced the demand for imports as such; exports become less competitive and expensive. It is argued that uncertainty of exchange rate in trading indicates that high volatility in exchange rates hinders trade volumes, as expected profits from such trade are highly uncertain (Alagidede & Ibrahim, 2016). The region remains dependent on international markets, and prices are structurally rising and becoming increasingly volatile.

The Turkish economy has similar economic situation to most West African countries; there is high dependence on imports in the production of key inputs for economic growth, such as oil, is negatively affected by the sharp appreciation of the exchange rate (Yükseler, 2019). A higher exchange rate drives up the price of imports, which creates cost-related inflation issues. While facilitating trade in traditional goods, cross-border data flows have increased dramatically, and e-commerce platforms have reduced trade costs by up to 60 % (World Bank, 2021). This was most evident during the COVID-19 pandemic, when social distancing restrictions increased demand for online commerce. The introduction of new forms of trade transforms the global economy as a means of reducing the impact of exchange rate fluctuations such as how the proliferation of hedging instruments in recent years has made us less vulnerable to risks arising from currency fluctuations.

Overall, Africa ranks low in trade facilitation, trade logistics, digital readiness, and regulatory environment, according to the country policy and institutional assessment (World Bank, 2019). Also, some challenges remain, such as exchange rate volatility, frequent tax audits, cumbersome bureaucracy in making processes, minimal capital requirements, expensive cell phone licenses, and high barriers to trade with neighbouring countries. Moreover, for developing countries to reap the full benefits of extra integration with the advanced countries, it is necessary to ensure stronger connection outreach (World Bank, 2019). Although lower consumption of foreign goods is a more desirable measure than import tariffs, it is used as a protection tool of economic policy. Decreased demand for foreign currency will lead to an increase in the price of the local currency, which may have a negative impact on the country's economy (Madura, 2011). In fact, the local currency has appreciated against other currencies, making domestic products relatively expensive abroad. This is supported

by Lerner's theory of symmetry (Lerner, 1946), which states that export subsidies are accompanied by import restrictions through tariffs and quotas; controlling exchange rate fluctuations.

The imposition of tariffs on imported goods could have undesirable consequences for the global economy, as countries can retaliate by imposing their own tariffs on imported goods. These tariffs and quotas can cause overall commodity prices to rise, which can lead to slower economic growth and higher inflation and interest rates, including reduced production and employment (Madura, 2011). In fact, the imposition of tariffs can lead to trade wars between countries, and the resulting macroeconomic consequences can negatively affect economies. Thus, exchange rate management is a major governmental economic policy tool in managing the balance of trade in West Africa.

### **2.5 Exchange Rate Movement, Trade Openness, and Institutional Quality**

International trade is vital to modern economies, as world governments seek to shape their economies through multitude of interventions (World Bank, 2021). International trade is the engine of global economic growth. Expanding trade and opening it up are important sources of rapid growth, employment (Irwin, 2019) and economies (Di Ubaldo & Winters, 2020). A trade deficit does not necessarily have a negative fiscal impact; however, in protecting national economic interests, it must be governed by internal local governmental systems (Madura, 2011). The degree of liberalization varies widely; across developing countries the main emphasis is on lowering trade barriers, while developed countries approach more complex agreements to achieve regulatory harmonization (Mattoo et al., 2020). This is because developing countries have inadequate fiscal and institutional capacity to support trade.

The relationship between institutions and economic performance has dominated debate by researchers and policymakers for decades. The forex market has undergone significant changes in recent decades. Central banks grapple with the need for appropriate communication to avoid the market's perception that foreign exchange intervention is inconsistent with monetary policy. The issue of exchange rate volatility is a major challenge as it increases certainty and transaction costs, making it a major disincentive to trading. However, financially highly developed countries are less negatively affected by exchange rate fluctuations due to the availability of financial instruments that hedge exchange rate risks (Héricourt & Poncet, 2013; Nicita, 2013). Unfortunately, West Africa is a predominantly agriculture-based, small, and fragile, and therefore vulnerable to weak institutions (World Bank, 2015).

In countries where institutions encourage corruption, nepotism, etc., the impact and volume of transactions are low because these increase costs. Economic theory indicates that the freedom of the central bank from biased power points towards a break between political and monetary control (Giesenow & De Haan, 2019). North (1990) found that good institutions have positive impacts on economic activity by reducing transaction, manufacturing, and production costs; hence, helping increase profitability. Nevertheless, poor institutions require more time and resources, which leads to increased risk and slower economic activity. In such emerging economies, institutional factors play a significant role in attracting trade as compared to economic factors. The quality of institutions affects profitability, by attracting foreign trade.

Exchange rate volatility in recent years has reignited debate about the impact of exchange rate volatility on trade volumes and global imbalances. The impact of global shocks is mitigated by the options available, including the active use of counter-cyclical policies; strengthening the independence of oversight institutions; and

establishing a resilient fiscal environment to contribute effectively to macroeconomic stability (Carney, 2015). The quality of the institutional structures in which a country participates can either challenge or facilitate trade (Liu et al., 2020). The Central Bank supervises and monitors the foreign exchange market according to achieve general economic goals such as controlling inflation, ensuring competitiveness, and maintaining financial stability. The exact objectives of the policy and how they translate into interventions in the foreign exchange market depend on the country's level of development, the degree to which financial markets are developed and integrated, and the country's overall vulnerability to shocks.

Foreign exchange reserves, which are assets held by central banks in foreign currencies used to back national liabilities, have become an integral part of monetary policy in open and liberal economies. Precautionary reasons for holding reserves are for intervention purposes and to prepare for emergencies and economic shocks. A study by Doan (2019) examining the impact of trade and institutional quality on real income in 45 sub-Saharan African countries. The study confirms that the quality of legal institutions and the quality of political institutions have significant positive effects on real income in random effects estimator. Political systems have an enormous impact on bilateral trading; democratic governments have similar imports and exports depending on income levels and regions in the country, which has a positive and significant impact on bilateral trade (Azu & Muhammad, 2020). High quality institutions can facilitate trade because strong institutions include protecting consumer rights, ensuring the rule of law and property rights, financial development, infrastructure improvement and innovation, and education that promotes business activities.



West Africa is governed by its own trade policy, regional considerations, and membership of international organisations such as the World Trade Organisation and West African Economic and Monetary Union. These provide trade enabling environment to actively stimulate private sector initiatives and achieve trade targets. In fact, these policies help to promote the increasing competitiveness of domestic manufacturers in the local and global markets in a fair manner by introducing import trading systems that promote and protect the interests of consumers. Gabaix and Maggiori (2015) presented a general equilibrium environment and showed that exchange intervention is effective against exchange rate fluctuations. Chang and Velasco (2017) studied currency intervention in a debt constrained environment and show that currency intervention is effective when these constraints are binding.

Moreover, Liu and Spiegel (2015) numerically solved the joint optimal response of financial asset tax, foreign exchange intervention and monetary policy to fundamental shocks in the New Keynesian model, showing that foreign exchange intervention tends against winds. Cavallino (2019) similarly found a new Keynesian model for studying optimal exchange rate interventions for non-core capital flow shocks, which characterize first-order solutions around the steady state. Amador et al. (2020) found that foreign exchange intervention is necessary to maintain a course of a given exchange rate in an environment of zero lower bound on nominal interest rates. OJeaga et al. (2014) investigated trade and institutional relations between regions during the period 1980-2010 using GMM technique. They found that institutions had a significant impact on trade, and this depends on the type of agency used. Domestic firms usually reduce trade and international firms promote trade. Fankem (2017) also measures trade openness, with the Squalli and Wilson (2011) index by using GMM arguing that trade openness decreases with increasing democracy in developing

countries. Malefane and Odhiambo (2018) conclude that promoting policies that support international trade is relevant to the South African economy.

Another study in Pakistan by Ali and Mingque (2018) used multiple regression analysis to argue that institutions have a positive effect on trade, while exchange rate and currency freedom have a negative effect on trade. Using a sample of 86 countries from 1996 to 2012, Alvarez et al. (2018) investigated the extent to which state institutions influence bilateral trade flows. Their work, using New Trade Theory and a pseudo-Poisson maximum likelihood estimation method, reveals that both institutional conditions of destination and institutional distance are important determinants of bilateral trade. Gnanon (2019) also uses GMM and found that tax reform, GDP per capita, decline in development aid, fiscal development, improvement in current account balances, population growth, lower inflation, and improvement in institutional quality, mainly have positive effects of trade in developing countries. Bi et al. (2019), in their study examined the factors affecting trade in services through a panel method in a sample of 46 countries during the period 2004 to 2015. Their analysis reveals an equivocal pattern of how institutional quality affects trade in services, but provides strong, unambiguous evidence of the importance of trade in goods to trade in services.

## **2.6 Exchange Rate Movement, Trade Openness, and Institutional Quality in**

### **Economic Crisis.**

During periods of economic shock, trade can have both positive and negative effects on fiscal performance. It is established that trade openness provides access to new markets, increase competitiveness, and even support economic growth (Doan, 2019; Duodu & Baidoo, 2020). It also exposes countries to greater economic risk and makes them more vulnerable to external economic shocks (World Bank, 2021). The impact

of being open in trade in economic performance during economic shocks is dependent on a variety of factors, which are the nature of the shock, the level of economic development of the country, and the responsiveness of its institutions (IMF, 2021). The important level of economic development and stronger institutions of a country are generally better able to absorb the negative effects of trade openness during periods of economic shock (Rajković et al., 2020). The fiscal crisis of 2008 had a severe world macroeconomic shock following the great depression. The collapse of international trade during that period, was swifter and greater; world trade reduced by about 30% (Baldwin, 2009). Even the European area is projected to experience shortage in fuel and natural gas distribution since Russia is their major supplier (Tan, 2022).

Conflicts and wars historically also have had destructive impact on regional and global economies (Jola-Sanchez & Serpa, 2021; Hang et al., 2021). The current war has sent shockwaves throughout all economies because there is supply interruptions while prices and significant energy has considerably risen (Bachmann et al., 2022; Chepeliev et al., 2022). Global economic surprises, the country's own characteristics and the source of the surprise, result in relative change in exchange rate movements (Gürkaynak et al., 2021). Therefore, an efficient policy approach is required to minimise the effects these global shocks. Trade policies that insulate the domestic markets from such surprises may multiple the volatility of global prices and be counterproductive in protecting the most vulnerable (Anderson et al., 2017). The global economic recession has economic consequence such as price decline, exchange rate depreciation, dismal stock market performance and changes in global financial conditions (African Union, 2020).

The challenges in trade are caused by the crisis in health and security systems due to the unpreparedness for these events, so it is a disparity between supply and demand causing discrepancy in society's function as well. It has created higher uncertainty of prediction on international trade (WIIW, 2020; EC., 2020). Many governments have had to implement exceptional policies to mitigate the effects of these sudden occurrences (Sargiacomo, 2015) which have devastating effect on national and global economies. The immediate result is the drastic reduced activities of industries as trade, tourism, transportation, and other service-oriented activities. The domino effect it has is, damaging other sectors of the economies includes logistics channels are disrupted, job loss rates surged dramatically, and reduced levels of consumption. Many studies do not consider the institutions in determining the level of trade openness and exchange rate which is a major concern. Good institutions affect performance primarily by nurturing appropriate policy choices such as the design of efficient international trade agreements; and regulations governing the functioning of labour, product, and financial markets. Thus, the central banks and governments can use a variety of tools to manage exchange rate volatility, including intervention in currency markets, currency controls, and monetary policy adjustments (Khudaykulova et al., 2022).

Financial development opens trade and promote economic growth but can also increase exchange rate volatility thus making countries vulnerable to external shocks (Mireku et al., 2017). The composition of the trade makes the economy susceptible to external surprises (OECD, 2011). A country depends on its own unique factors which are implementation of the national trade policy, the structure and quality of institutions (Sakyi & Afesorgbor, 2019). China, Russia, and Ukraine are major trading patter to West Africa and their cost competitiveness is increasingly strengthened by

advanced and improving infrastructure, rising research and development plus skill levels (Mohiuddin, 2017). Thus, West Africa susceptible to be affected by any happenings in these countries as this affects the economic growth (Zielinski et al., 2017).

Exchange rate volatility can have significant impacts on trade and investment flows, particularly during periods of economic shock (Mireku et al., 2017). Rising exchange rate causes increase in price of imports products which consist of basic essential goods such as petroleum, etc. and the countries rely heavily on imports for consumption. Exchange rate impacts inflation; affects economic decisions by increasing cost and standard of living thus, making life unbearable for the inhabitants. Thus, rising exchange rate volatility can be a hindrance to growth so intervention in such market remains an important feature of economic policy in contemporary system of prevalent flexible exchange rate regime. The high degree of exchange rate fluctuation; currency appreciation and depreciation and its leverage effects on economic activities have raised grave concern among macroeconomic experts and policymakers over the years.

Exchange rate volatility can increase the risk of trade and investment, making it more difficult for countries to attract foreign investment and to compete in global markets. Countries with strong institutions are generally better able to withstand economic shocks and to implement effective policy responses, while those with weak institutions are more vulnerable to economic turbulence (IMF, 2022). Reforms aimed at improving institutional quality can help to mitigate the negative impacts of the shock and to promote economic stability and growth. These reforms can increase economic growth, but also increase exchange rate volatility and make countries more vulnerable to external shocks (IMF, 1991). Exchange rate management is a consistent

adjustment in output and consumption that appropriate policies needs to be pursued to avoid the underlying causes of large, unpredictable, and damaging movements in exchange rates. Studies on exchange rate volatility and its impact on imports and exports still provide mixed results.

This assertion is lacking empirical evidence in the context of West Africa and this study seeks out to fulfil that. Just corresponding to Fankem (2017), this research tries to capture institutional quality based on political regimes. The aim of the study is to examine the influence of the exchange rate on trade flows; whiles considering the quality of institution (test the moderating role of quality institutions).

## **2.7 Conceptual Framework and Hypothesis Development**

According to Forson (2016), a conceptual framework is an illustration of an abstract idea that serves as a guide to the understanding of mechanisms by academics and professionals, and is, therefore, a multifaceted intellectual formulation of experiences that guides the course of study (Chinn & Kramer, 1999). Rudestam and Newton (1992) suggest that it leads to clarification of more research questions and their implications for further study. Thus, theories and conceptual frameworks are drawn to describe an abstract problem occurring under the same circumstances. Therefore, to understand and appreciate the matter better, these frameworks are constructed to be thought through: what accounts for exchanges rates volatility in the terms of trade, and the consequence of institutional quality on exchange rates and its volatility on trade flows. To begin with, there is extensive literature on the two broad sources of exchange rate volatility which includes trade imbalance because of capital flows and financial development as seen in figure 2.3. A summary of the various variables as they emerge from the various theories are also presented in table 2.2.

Inflation is a macroeconomic variable known to underpin the behaviour of exchange rate. So, understanding the impact of exchange rate movements on inflation will help formulate appropriate policy reaction (Aghion et al., 2009). Exchange rate affects inflation directly, through uncertainty and adjusted costs. Fluctuation in exchange rate volatility may also impact inflation by reducing the competitiveness of a country because higher price reduces expected profits but increases expected utility. The effect of exchange rate volatility on prices depends on the degree of competition and the relative degree of risk aversion and risk exposure of importers and exporters. That is, if exporters bear the risk, prices will increase but if importers do, prices may fall. Among the determinants of inflation are the availability of foreign currencies for public consumption, adequate foreign reserves and information asymmetry in the formal and informal markets which is a major challenge in developing countries because the exchange rate movements may not reflect the economic fundamentals (Alagidede & Ibrahim, 2016). There is an argument that the previous level of exchange rate will affect its current level of the rate. This is attributed to over dependency on natural resources as the main source of foreign exchange; which is undiversified, meanwhile there is the issue of low economic activities and general deterioration in the current account balance of many West African countries (Alagidede & Ibrahim, 2016). The first component of the framework seeks to find the implication of inflation on exchange rate volatility. The study therefore hypothesised that:

*H1*: There are significant drivers of exchange rate volatility in the ECOWAS.

The fixed exchange rate regime is rigid while flexible exchange rate allows the free movement of supply and demand of currency in the foreign exchange market. This suggests that countries which adopt flexible exchange rate regime are likely to feel

more impact from volatility. Therefore, flexible exchange rates regimes are subjected to excessive volatility and deviations from equilibrium values over time while fixed regimes do not reduce unanticipated fluctuations (Adewuyi & Akpokodje, 2013). Thus, exchange rates may be driven by fundamentals, and that changes in fundamentals would require similar, but more abrupt, movements in fixed parities. West African countries are classified into two groups based on their exchange rate policies, CFA, and the non-CFA zones. The CFA is fixed while the non-CFA countries have flexible exchange rate policy. This economic arrangement affects the economic performance of the countries. There has been unstable movement in exchange rates in Africa and a remarkable difference exists in the fluctuations of the exchange rates CFA and non-CFA groups. This difference stems from the fact that they pursue different monetary and exchange rate systems (Adewuyi & Akpokodje, 2013). Based on these findings, it is hypothesised that:

*H2: Exchange rate regimes significantly influence fluctuations in exchange rate positively of the ECOWAS.*

The third part of this framework requires a look at the consequences because of the role of government using efficient and effective institutions to regulating the exchange rates to ensure stability which leads to economic development as measured by GDP per capita as found obvious in available literature. This part surveys the literature on the quality of institutions which aids to prevent dysfunctional exchange rate market. The distinguishing characteristic of this framework is that it links theory with practice as it serves as general signposts for researchers in the pursuit of a particular trajectory. There is evident of Hecksher-Ohlin theory as there are more imports than exports in the sub-region making it, import-driven (World Bank, 2022). Almost everything is



imported into West Africa, even as such in 2021, Ghana imported \$214M (being the 1<sup>st</sup> largest) while Nigeria imported \$148M (10<sup>th</sup> largest) of used clothing (OEC, 2022) because there is low comparative advantage. Meanwhile the sub-region has comparative advantage in huge deposit of extractive, natural and human resources so exporting these commodities is never a challenge as in mercantilism, e.g., Nigeria is the 4<sup>th</sup> producer of oil (OEC, 2022).

So, ECOWAS regional bloc imports resources that it has less endowment, specialization, and advantage but exports resources that are abundant and highly advantaged to make up for any deficiencies. There are low technological transformational processes to add value to the resources so borrowing becomes the next available option. The region is known for the huge debts stock. Then, international trade is seen to enhance the quality of goods and services, as competition and variety options between domestic and foreign (World Bank, 2022). Financial development is also a source of the volatility as seen in figure 3. Financial development improves functions such as funds for expanding the production possibilities; allocation of funds to finance investments; enhancing the exchange of goods and services; stimulating the trading and hedging of risks thereby reducing transactional costs, improved service delivery and competition (Levine, 1997).

Good institutions are found to be an incentive used in reducing uncertainty and corruption thus promoting efficiency; thereby contribute to stronger economic performance by fostering better efficient policy framework (Forson, 2016). In effect, institutional framework and trade openness improves the financial development of countries as they are exposed to competition. Institutions that enforce the rule of law and trade openness have positive and direct impact on financial developments which

positively contribute to economic growth. High institutional quality leads to greater openness to trade, financial development, stronger competition, higher transparency, and stabilization of economy. Thus, it ensures policy sustainability and provides resilience to exogenous shocks and lessens volatility in macroeconomic variables. This framework proposes that the quality of institutions influences the exchange rate stabilisation and enhancing trade; so, it hypothesised that:

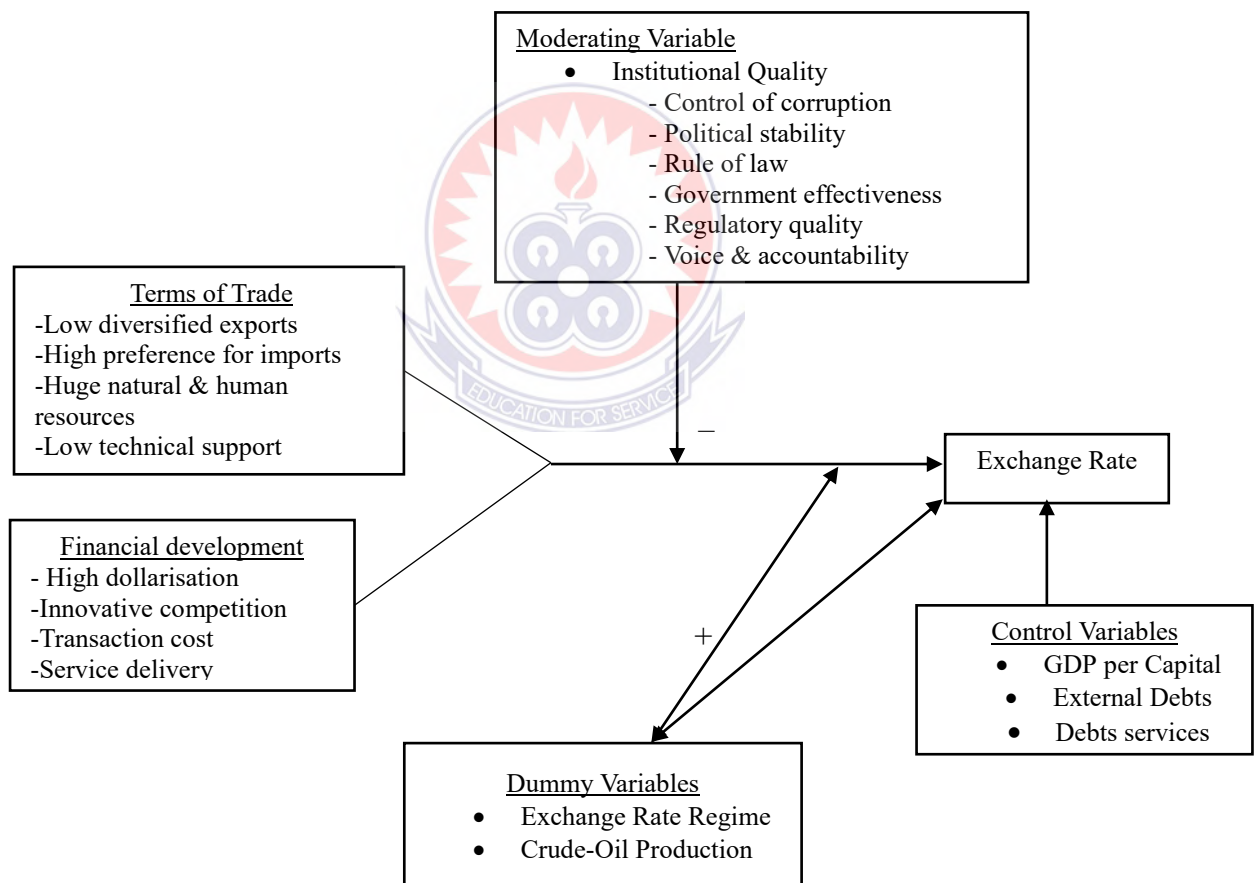
*H3*: Institutional quality has significant negative effect on the terms of trade and exchange rate in the ECOWAS.

Additionally, in floating regimes; the currency movements are unpredictable, and this may have undesirable influences on the balance of trade as in Marshal Lerner condition. This makes the domestic economies prone to external shocks and compromises on institutional effects which eventually limits the benefits of trade. Whereas, pegged regimes ensures with a certain level of discipline. So, volatility of exchange rates in undiversified economies makes profitability to be uncertain as purchasing power is affected and this is a risk to trade. Exchange rate volatility influences prices of commodities and the volume of international trade by limiting outputs and impeding economic productivity. Fluctuations in exchange rates brings about instability and uncertainty, as this leads to prohibitive costs of production, reduced volume of trade thus causing unanticipated redistributed income which further negatively affects unemployment, poverty, and balance of payment.

Also, US dollar has enjoyed a status of a reserve currency, and its large capital inflow causes its appreciation (Bénassy-Quéré, 2009) which affects purchasing power. The type of exchange rate regime and economic activities in an economy determines the currency movements as a condition in Marshal Lerner. Thus, countries are to

implement strategies that safeguards stability of their local currencies to enjoy economic growth (Senadza & Diaba, 2017) such as well-functioning efficient institutions. Thus, countries must attain a higher level of institutional quality for financial development to significantly impact on the exchange rates, trade, and other macroeconomic variables. Based on these, the following hypothesis is drawn to be tested:

*H4*: Institutional quality has significant negative effect on terms of trade and exchange rate depending on the exchange rate regimes and country's economic capacity in ECOWAS.



**Figure 2.3: Conceptual Framework Based on Literature**

Source: Author's Construct

**Table 2.2: Variable Summary Based on Literature**

<b>THEORIES</b>	<b>VARIABLES</b>	<b>DESCRIPTION</b>	<b>SOURCE</b>
New Institutional Theory	Governance Indicator	Institutional quality Indicators	WGI
Comparative Advantage Theory	Exports	Exports of goods and services (current US\$)	WDI
	Imports	Imports of goods and services (current US\$),	WDI
Marshall Lerner Condition theory	Exports	Exports of goods and services (current US\$)	WDI
	Imports	Imports of goods and services (current US\$),	WDI
	Exchange rate	Official Exchange Rate (LCU per US\$, period avg.)	WDI
Purchasing Power Parity Theory	Trade	Trade (current US\$)	WDI
	Financial Development	Financial Development Index	IMF
	Exchange rate	Official Exchange Rate (LCU per US\$, period avg.)	WDI
Other Relevant Variables from Literature	External debts	External debt stocks (% of GNI)	WDI
	Debts services	Debt service on external debt, total (TDS, current US\$)	WDI

Source: Author's Construct

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This section considers the research design, sources and description of data, the econometric estimations, and estimation technique used in analysing the data. This outlines the methods used in the study which are description of study design consisting of the variables and population used in this study; followed by methods of data collection procedure, and planned data analysis techniques used for this study. The study investigated the empirical; the terms of trade (difference in imports and exports), in relation to the changes in value of West African currencies in relation to the dollar, and the quality of the institutions. This research used secondary source of data collection process whiles annual panel data was applied in the analysis. This is because such panel data observation offers advantageous information on structure and dynamics of the variables used by making possible valid inferences beyond what can be done using one country case study.

#### **3.2 Research Design**

The study design describes the processes of the data to be collected and how the data is studied. It is the architectural design of the research that needs to be constructed for the intended objectives (Hakim, 2000). Therefore, it is described as the framework for the researcher to collect and analyse data relevant for achieving the objectives of the study. This is an explanatory research design for investigating the relationship between the terms of trade, exchange rate, and the quality of institutions in West Africa. Explanatory research design allows for the exploration of causal relationships and offers a comprehensive understanding of the complex interactions among the variables. Given the diverse economic, political, and institutional landscapes across

West African countries, this approach enabled the research to account for contextual variations and identified how specific institutional qualities influence the relationship between terms of trade and exchange rates. This design was well-suited to capture the multifaceted nature of institutional dynamics and their effect on a regional context. This aligned with the practical implications and design for an appropriate choice for the research objectives. This was intended to mimic some critical features of the study.

### **3.3 Population of the Study**

The ECOWAS is made up of fifteen member countries; so, this study uses all the member countries in ECOWAS as population sample. Thus, the analysis is based on the unbalanced panel data available on the countries. The countries are grouped into francophone verse non-francophone and oil producer verse non-oil producer. Specifically, there are eight francophone countries which are Benin, Burkina Faso, Guinea, Côte d'Ivoire, Mali, Niger, Senegal, and Togo and the seven non-francophone countries are Gambia, Ghana, Guinea-Bissau, Nigeria, Liberia, Sierra Leone, and Cabo Verde. Also, there are also three oil-producing; Ghana, Côte d'Ivoire, and Nigeria and twelve non-oil producing countries consist of Benin, Burkina Faso, Gambia, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Senegal, Sierra Leone, Togo, and Cabo Verde.

### **3.4 Sampling and Sampling Technique**

Census sampling is a sampling technique where data is collected on each and every member of the population. This sampling method, covering the whole population was used in this study because the ECOWAS is limited in number; so, the boundaries are

easily and clearly defined. Thus, this enables conclusions drawn from this study to be more accurate and reliable.

### **3.5 Source of Data**

This study employed secondary data which is primarily obtained from the websites of World Development Indicators are imports, exports, official exchange rate, external debts, debt services and GDP per capita; from World bank Governance Indicators, the six governance indicators are extracted and from IMF, financial development, is gathered. The data used in this research spans between 2000-2021 because it is the start of millennium and availability of data. The tools for collecting data that makes it possible for the intended research objectives to be accomplished. The study used the annual PARDL model to answer objectives (3) and (4). Whiles for measuring exchange rate volatility as desired in objectives (1) and (2), monthly data was collected on inflation and exchange rate from IMF and yahoo finance.

Other studies have proxied financial development by credit to private sector (Ngouhou et al., 2021; Duodu & Baidoo, 2020) however this study extracted financial development index made available by IMF which prevents the issue of omission of the complete nature of financial development. Institutional quality is the six governance indicators from the WGI measuring institutional quality ranging from weak to strong. Thus, institutional quality entails good policy development processes, controlled corruption, no political interferences, and precise property rights complementing economic activities to encourage growth. Exchange rate was measured by the official currencies to the United State dollar, which depict the influence of exchange rates in the international market. The US dollar is considered since it is mostly used invoicing currency in international trades, the most important

reserve currency in the world, and the currency used for most international commercial transactions.

### **3.6 Measurement of Variables of the Study**

Variables are individual elements that data are collected on (Saunders et al., 2007). This includes dependent variable being exchange rate and exchange rate returns while the independent variables are measured as financial development and terms of trade (ratio of exports over imports) including inflation. All the indicators are used to measure their individual roles. Institutional quality sheds light on the moderating role on the relationship among the variables. Similarly gross domestic product which measures economic growth serves as control variable; the sub-region is known for its high borrowing heights, so this study also introduces external debts and debt servicing. Dummy variables are introduced in the study to account for oil extraction and exchange rate regimes. Table 2.2 as earlier stated gives a description of the variables employed in the analysis based on the literature.

#### ***3.6.1 Dependent Variable***

Exchange rate for this study is measured by official exchange rate of the West African countries currencies to the US dollar are used to determine the volatility in exchange rate while the rate of returns is used in determining the relationship; measured by the present exchange rate over the previous rate of the countries. The exchange rate considered for this study is the various currencies against the US dollar to ensure unity. The US dollar is chosen because it is the utmost traded currency as defined by daily trade size and some macroeconomic variables.



### ***3.6.2 Independent Variables***

The terms of trade is defined as a ratio of exports over the imports; of West Africa countries and inflation which is also measured as consumer prices index. Financial development in this study is an index from IMF which captures the complex multidimensional nature of financial development.

### ***3.6.3 Moderating Variable***

This study uses all the six indicators of institution quality distinctly for a comprehensive analysis. The study then, captures a composite index of these six variables using PCA which has been extensively applied in literature (Abaidoo & Agyapong, 2022). The indicators which are highly interrelated with one another; include political stability, government effectiveness, control of corruption, voice and accountability and rule of law. In this case, control of corruption represent the influence bad governance has on economic interactions; political stability (the instability aspect) shows excessive violence and unconstitutional interferences where governments are overthrown; regulatory quality reflects the transaction costs from policy intrusion by states; rule of law measures the quality of the legal and contractual enforcements; voice and accountability represents that leaders are held responsible for their actions with government effectiveness representing the effective policy formulating and implementing ability of governments.

### ***3.6.4 Dummy Variables***

In this study, for the analysis, two dummy variables are introduced. Thus, dummy variables are used to separate between oil producing countries and non-oil producing countries i.e. (0 for oil producing country, otherwise 1) and differentiate francophone

and non-francophone countries i.e. (1 for francophone country, otherwise 0). This aids to get a true reflection of the region and to fulfil the objectives of this research.

### **3.6.5 Control Variables**

The control variables in this study includes gross domestic product which is a measure of GDP per capita current representing economic development. Reports from IMF and World Bank between the period 2021 to 2023; have over and again stressed that the high debts level coupled with factors have influence over a country's exchange rate. External debts are defined as total external debt stocks to gross national income while total debt service is the sum of principal repayments and interest actually paid in currency, goods, or services.

### **3.7 Model Estimation**

In this study, ten models were specified to investigate and achieve the desired outcome. This includes the variables themselves without any interactions and models with the interactions between the variables on the outcome.

Objective (1)

The ARCH model includes two equations: (i) the mean equation and (ii) the conditional variance equation. The standard GARCH (1,1) model estimation is

$$\sigma_{it}^2 = \omega + \alpha\mu_{it-1}^2 + \beta\sigma_{it-1}^2 \quad (1)$$

The ARCH term ( $\sigma$ ) is the lag of the squared residual from the mean equation and the GARCH term ( $\beta$ ) is the forecasted variance from the previous period while  $\omega$  is the constant term.

The exponential GARCH (EGARCH) model by Nelson (1991) permits for asymmetric effects between positive and negative returns.

$$\text{Log}(\sigma^2) = \omega + \sum_{j=1}^{\infty} \beta_j \log(\sigma^2_{it=j}) + \sum_{j=1}^{\infty} \alpha_j \left| \frac{m_{it-j}}{\sigma_{it-j}} \right| + \sum_{k=1}^r \gamma_k \left| \frac{m_{it-k}}{\sigma_{it-k}} \right| + \quad (2)$$

To include a dummy or regressor, we have:

Objective (2)

$$\sigma_{it}^2 = \omega + \alpha \mu^2_{it-1} + \beta \sigma^2_{it-1} + \xi \text{ dum}_{it} \quad (3)$$

$$\text{Log}(\sigma_{it}^2) = \omega + \sum_{j=1}^{\infty} \beta_j \log(\sigma^2_{it=j}) + \sum_{j=1}^{\infty} \alpha_j \left| \frac{m_{it-j}}{\sigma_{it-j}} \right| + \sum_{k=1}^r \gamma_k \left| \frac{m_{it-k}}{\sigma_{it-k}} \right| +$$

$$\sum_{k=1}^k \xi_k \text{ dum}_{it-k} \quad (4)$$

For the econometric estimations, the theoretical model is expressed empirically as:

Objective (3)

$$\text{ER}_{it} = \alpha_0 + \beta_1 \text{IQ}_{it} + \beta_2 \sum_{k=1}^k \text{ERDV}_{it} + \beta_3 \sum_{k=1}^k \text{ERCV}_{it} + \varepsilon_{it} \quad (5)$$

Thus, with the interactions between the variables, it can be estimated as the following:

$$\text{ER}_{it} = \alpha_0 + \beta_1 \text{IQ}_{it} + \beta_2 \sum_{k=1}^k \text{ERDV}_{it} + \beta_3 \sum_{k=1}^k \text{ERCV}_{it} + \beta_4 \text{ERITV}_{it} + \varepsilon_{it} \quad (6)$$

Objective (4)

$$\text{ER}_{it} = \alpha_0 + \beta_1 \text{IQ}_{it} + \beta_2 \sum_{k=1}^k \text{ERDV}_{it} + \beta_3 \sum_{k=1}^k \text{ERCV}_{it} + \text{CI}_{it} + \text{OE}_{it} + \varepsilon_{it} \quad (7)$$

Thus, with the interactions between the variables, it can be estimated as the following:

$$\text{ER}_{it} = \alpha_0 + \beta_1 \text{IQ}_{it} + \beta_2 \sum_{k=1}^k \text{ERDV}_{it} + \beta_3 \sum_{k=1}^k \text{ERCV}_{it} + \beta_4 \text{ERITV}_{it} + \text{CI}_{it} + \text{OE}_{it} + \varepsilon_{it} \quad (8)$$

Where:

$\text{ER}_{it}$  = exchange rate returns (defined as current /previous) over country and time

$\text{IQ}_{it}$  = Institutional quality over country and time

$\text{ERDV}_{it}$  = explanatory variables which include

$\text{FD}_{it}$  = financial development over country and time

$\text{TT}_{it}$  = terms of trade ((defined as ratio of exports/imports) over country and time

$ERCV_{it}$  = control variable which include

$GDP_{it}$  = GDP per capita over country and time

$ED_{it}$  = external debts over country and time &

$DS_{it}$  = debt services per capita over country and time

$ERITV_{it}$  = interactions between the variables over country and time

$OE_{it}$  = 0 for oil producing country, 1 otherwise over country and time

$CI_{it}$  = 1 for francophone country, 0 otherwise over country and time &

$\varepsilon_{it}$  = stochastic term over country and time

Thus, the PARDL equations in this study specify both the short and long run estimates in a single equation as follows:

$$\begin{aligned} \ln ER_{it} = & \alpha_0 + \sum_{j=0}^{\infty} \tau_{ij} \Delta I Q_{it=j} + \sum_{j=0}^{\infty} \gamma_{ij} \Delta \ln(\sum_{k=1}^k ERDV_{it})_{it=j} + \\ & \sum_{j=0}^{\infty} \phi_{ij} \Delta \ln(\sum_{k=1}^k ERCV_{it})_{it=j} + \beta_1 I Q_{it=j} + \beta_2 \ln(\sum_{k=1}^k ERDV_{it})_{it=j} \\ & + \beta_3 \ln(\sum_{k=1}^k ERCV_{it})_{it=j} + \varepsilon_{it} \end{aligned} \quad (9)$$

$$\begin{aligned} \ln ER_{it} = & \alpha_0 + \sum_{j=0}^{\infty} \tau_{ij} \Delta I Q_{it=j} + \sum_{j=0}^{\infty} \gamma_{ij} \Delta \ln(\sum_{k=1}^K ERDV_{it})_{it=j} + \\ & \sum_{j=0}^{\infty} \phi_{ij} \Delta \ln(\sum_{k=1}^k ERCV_{it})_{it=j} + \sum_{i=1}^{\infty} \sigma_{ij} \Delta \ln(ERITV)_{it=j} + \beta_1 I Q_{it=j} + \beta_2 \ln \\ & (\sum_{i=1}^{15} \beta_2 ERDV_{it})_{it=j} + \beta_3 \ln(\sum_{k=1}^k ERCV_{it})_{it=j} + \beta_4 \ln(ERITV)_{it=j} + \varepsilon_{it} \end{aligned} \quad (10)$$

$$\begin{aligned} \ln ER_{it} = & \alpha_0 + \sum_{j=0}^{\infty} \tau_{ij} \Delta I Q_{it=j} + \sum_{j=0}^{\infty} \gamma_{ij} \Delta \ln(\sum_{k=1}^K \beta_2 ERDV_{it})_{it=j} + \\ & \sum_{j=0}^{\infty} \phi_{ij} \Delta \ln(\sum_{k=1}^k ERCV_{it})_{it=j} + \beta_1 I Q_{it=j} + \beta_2 \ln(\sum_{k=1}^k ERDV_{it})_{it=j} + \\ & \beta_3 \ln(\sum_{k=1}^k ERCV_{it})_{it=j} + OE_{it=j} + CI_{it=j} + \varepsilon_{it} \end{aligned} \quad (11)$$

$$\begin{aligned} \ln EV_{it} = & \alpha_0 + \sum_{j=0}^{\infty} \tau_{ij} \Delta I Q_{it=j} + \sum_{j=0}^{\infty} \gamma_{ij} \Delta \ln(\sum_{k=1}^k \beta_2 ERDV_{it})_{it=j} + \\ & \sum_{j=0}^{\infty} \phi_{ij} \Delta \ln(\sum_{k=1}^k ERCV_{it})_{it=j} + \sum_{i=1}^{\infty} \sigma_{ij} \Delta \ln(ERITV)_{it=j} + \beta_1 I Q_{it=j} + \beta_2 \ln \end{aligned}$$

$$(\sum_{k=1}^k ERDV_{it})_{it=j} + \beta_3 \ln(\sum_{k=1}^k ERVCV_{it})_{it=j} + \beta_4 \ln(ERITV)_{it=j} + OE_{it=j} + CI_{it=j} + \varepsilon_{it} \quad (12)$$

where  $\tau$  to  $\sigma$  are the short-run coefficients while  $\beta_1$  to  $\beta_4$  are the long-run coefficients.

The panel ECM model can be expressed as follows:

$$\begin{aligned} & \ln ER_{it} \\ &= \sum_{j=0}^{\infty} \tau_{ij} \Delta I Q_{it=j} + \sum_{j=0}^{\infty} \gamma_{ij} \Delta \ln(\sum_{k=1}^k ERDV_{it})_{it=j} + \\ & \sum_{j=0}^{\infty} \phi_{ij} \Delta \ln(\sum_{k=1}^k ERVCV_{it})_{it=j} + \theta_i ECM_{it-1} + \varepsilon_{it} \end{aligned} \quad (13)$$

$$\begin{aligned} & \ln ER_{it} \\ &= \sum_{j=0}^{\infty} \tau_{ij} \Delta I Q_{it=j} + \sum_{j=0}^{\infty} \gamma_{ij} \Delta \ln(\sum_{k=1}^k ERDV_{it})_{it=j} + \\ & \sum_{j=0}^{\infty} \phi_{ij} \Delta \ln(\sum_{k=1}^k ERVCV_{it})_{it=j} + \sum_{j=0}^{\infty} \sigma_{ij} \Delta \ln(ERITV)_{it=j} + \theta_i ECM_{it-1} + \varepsilon_{it} \end{aligned} \quad (14)$$

$$\begin{aligned} & \ln ER_{it} \\ &= \sum_{j=0}^{\infty} \tau_{ij} \Delta I Q_{it=j} + \sum_{j=0}^{\infty} \gamma_{ij} \Delta \ln(\sum_{k=1}^k ERDV_{it})_{it=j} + \\ & \sum_{j=0}^{\infty} \phi_{ij} \Delta \ln(\sum_{k=1}^k ERVCV_{it})_{it=j} + \theta_i ECM_{it-1} + OE_{it} + CI_{it} + \varepsilon_{it} \end{aligned} \quad (15)$$

$$\begin{aligned} & \ln ER_{it} \\ &= \sum_{j=0}^{\infty} \tau_{ij} \Delta I Q_{it=j} + \sum_{j=0}^{\infty} \gamma_{ij} \Delta \ln(\sum_{k=1}^k ERDV_{it})_{it=j} + \\ & \sum_{j=0}^{\infty} \phi_{ij} \Delta \ln(\sum_{k=1}^k ERVCV_{it})_{it=j} + \sum_{j=0}^{\infty} \sigma_{ij} \Delta \ln(ERITV)_{it=j} + \theta_i ECM_{it-1} + OE_{it} \\ & + CI_{it} + \varepsilon_{it} \end{aligned} \quad (16)$$

where  $\Delta$  denote the first difference and  $\theta_i$ , the coefficient of the ECM which measures the speed of adjustment that is made every year towards long-run equilibrium.

### 3.8 Data Analysis Method

Panel techniques are used to interpret the data as it pools observation on different units over several time periods. Panel unit root tests were conducted using Im-Pesaran-Shin and Fisher-type techniques (Im et al., 2003) which are usually applied to an unbalanced panel dataset. Findings were presented using graphical representation via tables and figures. Stata 14 software and EViews 12 Packages are useful for this analysis.

This study to achieve its objectives used the ARCH series models because it provides statistical stage on which theories are and tested. In predicting conditional variances of exchange rate in ECOWAS this study used GARCH, EGARCH, TGARCH and NARCH. The GARCH developed by Bollerslev (1986) was used because it is believed that exchange rate best follows the GARCH process (McKenzie, 1999) and captures past values of the exchange rate as opposed to the ARCH (Alageide & Ibrahim, 2016). Thus, GARCH model allows the error term to have a time varying variance conditional on the past behaviour of the series hence reflecting the actual volatilities as imaged whiles the EGARCH model captures the asymmetric effects and expresses conditional volatility logarithmically.

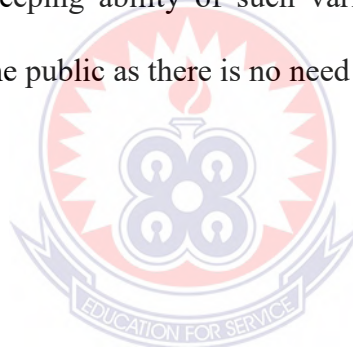
Also, the researcher made the following estimations to choose Panel Autoregressive Distributed Lag Model (PARDL). The reason for using the PARDL Bound Testing approach is that it enables the estimation of short and long-run parameters of the model simultaneously and it allows for a combination of variables integrated of different orders, i.e.,  $I(0)$  and  $I(1)$  Pesaran et al. (2001). Also, it does not make unit root test a requirement and this makes the PARDL model superior to conventional approaches (Johansen, 1991 & Engle, 1987). Estimating the error-correction

mechanism (ECM) is applied to show the existence of a relationship between the exchange rate and the other variables.

Research activities are carried out to confirm that data passed classical assumption tests at 5% level of significance. The study does not suffer from any econometric and statistical problem because series of diagnostic tests were conducted to ensure reliable and robust results.

### **3.9 Ethic Consideration**

Data are extracted from these organizations to enable the researcher to answer the study questions. These sources are chosen because of their credibility and comprehensive record keeping ability of such variables. Again, it is free, easy to access and available to the public as there is no need to request for prior authorisation.



## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### 4.1 Introduction

In finding answers to the objectives of this research; that is to investigate the exchange rate volatility and the role of institutions in exchange rate movement in the ECOWAS region regarding the terms of trade. Thus, this study which is a panel regression looked at exchange rate as the dependent variable while the institutional quality being the moderating variable including other variables. Thus, this session presents the results generated from analysing the available secondary data and discussing it using tables. Based on the data, different specifications of the model were estimated by using the same set of variables, but under different conditions for each model within similar period; 2000 to 2021.

#### 4.2 Presentation and Discussion of Statistical Descriptive Analysis

The summary statistics of the variables used in the study are analysed before discussing the main objectives of the study. The general position of the whole West Africa is displayed in Table.4.1 while the grouping is done in Table 4.2. The tables showed the statistical description including the mean which represent the average indicators, standard deviation which measure the variation of the variable, maximum, minimum and the kurtosis of the data variables. In this case, GDP had the highest means in West Africa and all the categories except the non-francophone and oil producing countries where inflation had the highest mean in the study. The terms of trade had relatively low means. Meanwhile the variable that has the lowest mean in all the categories are institutional quality index, exchange rate returns and financial development for all categories. Generally, the low records of institutional quality index indicate the poor institutional structure in the sub-region.



**Table 4.1: Descriptive Statistics of West Africa**

Variable	Obs	Mean	Std. Dev.	Min	Max	Jarque-Bera	Skewness	Kurtosis
Institutional Quality Index	305	-0.0007	1.0016	-1.467	2.6374	25.4800	0.6478	2.4228
Regulatory Quality	305	0.2969	0.1324	0.0199	0.6106	14.4495	0.1740	1.9921
Control of Corruption	305	0.3226	0.1932	0.0053	0.8404	28.5246	0.7491	2.9899
Government Effectiveness	305	0.2466	0.1583	0	0.6635	25.2796	0.6439	2.4247
Political Stability	305	0.3305	0.2068	0.0097	0.9048	10.6801	0.3520	2.4128
Rule of Law	305	0.3028	0.1799	0.0141	0.75	14.9673	0.3554	2.1799
Voice & Accountability	305	0.3894	0.1708	0.0887	0.7923	10.4915	0.3644	2.4574
Financial Development	305	0.0874	0.1605	-1.124	0.2701	12448.16	-5.07	32.61
GDP	305	6.7056	0.6678	4.9324	8.1711	8.2932	0.3223	2.5132
Exchange Rate	305	0.0369	1.2689	-4.597	8.1959	4979.079	2.7006	2.0427
Term of Trade	305	4.5188	0.5608	2.8997	5.9819	3.6682	-0.1953	2.6381
Inflation	305	5.5027	6.4608	-3.5	40.2409	417.7927	1.7398	7.5572
External Debts	305	4.7982	4.1661	1.5996	21.3021	1530.958	3.2183	11.8904
Debts Service	305	1.9771	0.3682	0.65	2.2971	1304.908	-3.0379	11.1096

Source: Author's Construct (Fieldwork 2023)

A general outlook on West Africa shows that, there is high inflation, with external debt closely followed by the terms of trade while institutional quality index had the lowest mean figures. Comparatively, the terms of trade, inflation and external debts had similar records in non-oil producing countries while institutional quality index had the lowest record in that category. It is seen that exchange rate returns had the lowest mean in oil-producing and non-francophone countries. Also, among the institutional quality indicators, voice and accountability has the highest mean with government effectiveness having the lowest mean in the ECOWAS likewise both francophone and non-francophone, including non-oil producing countries of West Africa. However, for oil-producing countries, though voice and accountability had the highest mean; political stability had the lowest mean.

In Table 4.1, inflation has the highest standard deviation with financial development recording the lowest standard deviation. For non-francophone countries, inflation again recorded the highest standard deviation while external debt had the highest for

francophones. Inflation again had the highest standard deviation in both oil-producing and non-oil producing countries and it can be observed that in the same grouping, financial development had the lowest of standard deviation. Thus, it can be observed that debts service and financial development have low of standard deviation. Generally, it can be observed that the pattern for the mean and standard deviation are similar throughout the various segregations. Thus, it can be deduced that oil producing countries may have similarity as that of the non-francophone countries while francophone countries and non-oil producing countries are dissimilar.

Kurtosis which represents the peak of the various variables only considered the general West African. External debts, debts service, inflation and financial development have records of kurtosis value which is greater than 3. The terms of trade, financial development and debts services are negatively skewed while the remaining variables are positively skewed. The minimum and maximum inflation records for West Africa, non-francophone and non-oil producing are similar; that is - 3.5 and 40.2409, respectively. The summary statistics also shows that there is incredibly low financial development as the overall mean for west Africa is 8.7%; 10.9% for non-francophone countries; 7% for francophone countries; 13.7% for oil-producing countries and 7% for non-oil producing countries.

**Table 4.2A: Descriptive Statistics for groupings of the countries in ECOWAS**

Variable	Oil-producing countries				Non-oil producing countries			
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
<b>IQ</b>	0.1572	1.0723	-1.1597	2.1033	-0.0419	0.9804	-1.467	2.6374
RQ	0.3225	0.1437	0.0846	0.5498	0.2903	0.1288	0.0199	0.6106
CC	0.2918	0.193	0.0053	0.5885	0.3307	0.1933	0.0192	0.8404
GE	0.2723	0.1691	0.0647	0.5792	0.2399	0.1551	0	0.6635
PS	0.2058	0.188	0.0097	0.5330	0.3629	0.1994	0.0193	0.9048
RL	0.2818	0.2015	0.0431	0.6106	0.3082	0.1739	0.0141	0.75
VA	0.381	0.1754	0.101	0.6749	0.3916	0.1698	0.0887	0.7923
FD	0.1373	0.1470	-0.7192	0.2701	0.0744	0.1616	-1.124	0.2574
Log-GDP	7.3087	0.5600	5.5349	8.0712	6.5486	0.6016	4.9324	8.1711
Log-ER	-0.1894	1.1050	-4.5965	1.7895	0.0729	1.3284	-3.5739	8.1959
Log-TT	4.4701	0.2855	3.5838	4.9363	4.5286	0.6010	2.8997	5.9819
IF	9.4377	7.4123	-1.1069	40.2409	4.9750	6.5028	-3.5	40.2409
Log-ED	3.3409	0.9238	1.5996	4.9376	5.1776	4.5798	2.2435	21.3021
Log-DS	2.2004	0.0466	2.1218	2.2971	1.919	0.3925	0.65	2.2489

Source: Author's Construct (Fieldwork 2023)

For West Africa to properly capture the entirety of its trading activity; institution quality needs in-depth examination. Thus, this confirms the new institutional theory that since there is low institutional quality there is creation of higher uncertainty (North, 1990 & Forson, 2016). For institutional quality to be effective there should be increased financial development. In this case there is evident of low financial development which can be attributed to high corruption and rising political unrest within the sub-region. As a result, West African countries have not achieved much growth which should not have been the case, if efficient and effective strategies are implemented and followed through thoroughly.

The mean for the terms of trade for francophone countries are low demonstrating that most francophone countries are not as naturally endowed with resources as non-francophone countries as such; Nigeria is among the leading oil producers in the world. These situations support comparative advantage, and Hecksher-Ohlin theories. Furthermore, it can be observed that there are huge debts rate that being paid off while receiving more debts as established by the recorded means and this is not

surprising at all. As expected, oil-producing countries receives relatively fewer external debts as the terms of trade records the higher mean. Thus, the only difference is that oil-producing have better terms of trade which limits the external borrowing than non-oil producing f countries.

**Table 4.2B: Descriptive Statistics for groupings of the countries in ECOWAS**

Variable	Non-francophone Countries				Francophone countries			
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
IQ	0.0319	1.2259	-1.467	2.6374	-0.0281	0.7663	-1.3842	1.9972
FD	0.1085	0.1348	-0.7192	0.2701	0.0695	0.1779	-1.124	0.1813
Log-GDP	6.8171	0.7833	4.9324	8.1711	6.6109	0.5356	5.2621	7.8435
Log-ER	-0.2574	1.0551	-4.5965	3.4666	0.2867	1.3799	-2.8477	8.1959
Log-TT	4.2799	0.59401	2.8997	5.9819	4.7216	0.4403	3.5163	5.5788
IF	7.9481	6.7210	-3.5	40.2409	3.4277	5.4455	-3.5	34.7
Log-ED	3.8136	0.95459	1.5996	6.2702	5.6337	5.4654	2.2435	21.3021
RQ	0.2880	0.1537	0.0199	0.6106	0.3045	0.1112	0.0865	0.5118
CC	0.3468	0.2307	0.0053	0.8404	0.3022	0.1523	0.0192	0.6455
GE	0.2589	0.1879	0	0.6635	0.2363	0.1276	0.0192	0.5625
PS	0.36	0.2369	0.0193	0.9048	0.3055	0.1743	0.0097	0.7460
RL	0.3118	0.2167	0.0141	0.75	0.2952	0.1417	0.0284	0.5721
VA	0.4184	0.1893	0.0887	0.7923	0.3648	0.1495	0.0913	0.607
Log-DS	2.0543	0.1148	1.8153	2.2971	1.9116	0.4804	0.65	2.2489

Source: Author's Construct (Fieldwork 2023)

### 4.3 Unit Root Test.

The study through the application of Im-Pesaran-Shin and Fisher-Type unit root tests found the stationarity (at order and level) of the variables used in this study as detailed in Table 4.3. These tests confirmed that the variables remain stable at a certain level to avoid inefficient and biased results. The outcomes of the unit-root test are fused into the analysis constructed on the order of integration; such that, variables of I (0) series are counted into the model without been differenced while variables of I (1) series are differenced. In this case, all the variables used for this study are level at first order.

**Table 4.3: Im-Pesaran-Shin and Fisher-Type Unit-Root Test of Stationarity**

<b>Variable</b>	<b>Order of Integration</b>	<b>Fisher-type</b>	<b>Im-Pesaran-Shin</b>
IF	I (1)	-31.5714***	-10.0138***
Log-ER	I (1)	-19.2634***	-5.6801***
FD	I (1)	-11.0033***	-7.9394***
GDP	I (1)	-11.4656 ***	- 6.3349 ***
IQ	I (1)	-21.3685***	-7.4669 ***
RQ	I (1)	-24.1924***	-8.4828***
CC	I (1)	-15.8236***	-7.5060***
GE	I (1)	-21.2983***	-7.4264***
PS	I (1)	-22.4650***	-8.5425***
RL	I (1)	-20.3411***	-7.8502***
VA	I (1)	-18.8897***	-7.2604***
Log-TT	I (1)	-9.6131***	-8.1938***
Log-ED	I (1)	-7.8216***	-6.6811***
Log-DS	I (1)	-17.6812 ***	-7.6778 ***

Source: Author's Construct (Fieldwork 2023)

The study is begun by firstly ensuring that all the diagnostic checks are done, and this can be found at the appendix. This study concludes from the diagnostic tests that there are no econometric problems.

The correlation matrix showing the strength and nature of relationship between the variables and their significant level can be seen at the appendix. The institutional quality indicators are highly correlated among themselves. The other variables in the study are correlated between 0.07% to 46.40%, depicting that all the correlation is below 50% except for the correlation between the indicators of institutional quality; external debt and debts services which are highly correlated. This will not affect the results of the study as argued by Wooldridge, (2012) and Forson et al., (2021). There are no issues of autocorrelation in this study.

It can be realized that exchange rate return has a negative relationship with almost all the other variables, except the terms of trade and external debts. This means that exchange rate return reacts negatively with inflation, GDP, both institutional quality indicators and index, financial development, and debts services whiles it reacts

positively with the terms of trade and external debts. Also, exchange rate returns have statistically significant relationship with the terms of trade, regulatory quality, government effectiveness, rule of law and institutional quality index. Finally, the least correlated pairs are financial development with debts services and external debts. The implication of the matrix is to detect any possibility of perfect collinearity and it can be observed that the variables are fairly correlated. Thus, the correlation coefficients show that there are no issues of multicollinearity among other estimation variables.

#### **4.4 Drivers of Exchange Rate Volatility in ECOWAS**

For this study, ARCH family regression was used to measure the volatility of exchange rate for West Africa which includes GARCH, EGARCH, NARCH, and TGARCH using monthly data because it required high frequency data. The variables used are inflation and exchange rates based on availability of data. Inflation is also considered important for fluctuations in exchange rate because the sub-region heavily depends on the imports of final goods and capital goods for consumption and production (Adewuyi & Akpokodje, 2013). Monthly unbalanced data, between January 2009 to December 2021 are obtained from yahoo finance and IMF database to achieve the desired outcome for the fifteen West African countries. Dummy variable is employed to find if exchange rate regimes impact volatility. The analysis is based on the commonest results of the ARCH models amongst the divisions used for this study.

The result from the diagnostic tests as reported and it can be found in the appendix; concludes that, the estimated model does not suffer from any econometric problem. Implying that there is ARCH effect whiles there are no issues of serial correlation, heteroscedasticity, and poor functional form. The plot of CUSUM reported in appendix indicates that model is stable.

#### 4.4.1 Drivers of Exchange Volatility in ECOWAS

**Table 4.4: Drivers of Exchange Rate Volatility in ECOWAS-Aggregate Estimates**

Parameter	GARCH	EGARCH	NARCH	TGARCH
C	-0.0478***(0.0037)	-0.0326***(0.0039)	-0.0177***(0.0057)	-0.0247***(0.0055)
Log-ER <sub>it-1</sub>	1.01***(0.0004)	1.0094***(0.0004)	1.0076***(0.0006)	1.0086***(0.0005)
IF <sub>it</sub>	0.0015***(0.0003)	0.0015***(0.0003)	-0.0028***(0.0006)	-0.0027***(0.0006)
C	0.0077***(0.0004)	-4.2521***(0.0339)	-0.0042***(0.001)	-0.0002(0.0002)
$\alpha$	1.2778***(0.0326)	0.5118***(0.0413)	0.1358***(0.0212)	-0.0669***(0.016)
$\beta$	-0.0134*(0.0074)	-0.0203(0.0195)	0.7553***(0.0217)	0.7608***(0.0228)
$\Upsilon$		1.0328***(0.0344)	-0.1851***(0.0330)	0.4586***(0.0397)
$\alpha+\beta$	1.2644	0.4915	0.8911	0.6939
Number of Obs	1,999	1,999	1,999	1,999
Wald $\chi^2$	6920000	9930000	7510000	8050000
P $\chi^2$	0	0	0	0
Log likelihood	1279.416	1474.632	1360.551	1324.026

Source: Author's Construct (Fieldwork 2023)

Note: \*\*\*, \*\* and \* are significant level at 1%, 5% and 10% respectively.

Values in () are robust standard errors.

The foundation of using the ARCH model in this estimation was to find the presence of volatility in ECOWAS as objective one. The news impact curve of the GARCH, EGARCH and TGARCH are all reported in the appendix including the residual graph and conditional variance. In this study, as shown in Table 4.4, past exchange rate volatility can increase current exchange rate volatility by a significant level of 1% *ceteris paribus*. The past has the most positive impact on increasing exchange rate volatility due to the large, lagged exchange rate coefficient. This suggests that current exchange rate fluctuations are influenced by past exchange rate fluctuations than inflation in West African countries. Therefore, past exchange rate volatility has much stronger predictive power on current exchange rate volatility. Thus, all other things being equal, previous exchange rate volatility is the main determinant of exchange rate. This may be due to existing underlying conditions as purported by Ameziane and Benyacoub (2022) that have not been addressed, such as civil war and political instability, substantial number of foreign-owned companies, high external borrowing, and dependence on imports. Generally, uncertainty in implemented economic policies and the global financial market significantly increases exchange rate volatility as purported by a study of Aftab et al. (2023).

The study finds a mixture of negative and positive inflation coefficients for exchange rate volatility of West African countries, which is statistically significant at 1% for all ARCH regressions used. This suggests that inflation as a crucial factor of exchange rate fluctuations as found in a study of Iscan and Kaygisiz (2019). The result assumes that ECOWAS follows the global inflation trends. All other things being equal, a rise in inflation can have a positive or negative impact on exchange rate volatility; while an increase in past exchange rate volatility can also increase current exchange rate volatility. This therefore confirms interest parity theory and literature that the drivers



of exchange rate fluctuations are non-deterministic. In effect, inflation is dependent on other macroeconomic variables to determine volatility in exchange rate. Therefore, this study establishes that inflation does not positively significantly affect fluctuations in exchange rate.

The coefficient of the constant variance term has negative coefficients though it is statistically significant for all models meaning the average exchange rate volatility for the ECOWAS region has a negative significant impact. Most of coefficients of the model are statistically significant under 1% level. This result establishes that exchange rate volatility in West African countries has time varying conditional volatility; thus, confirming studies of Fofanah (2020); Senadza and Diaba (2017); that foreign exchange rate for African countries is highly unpredictable. The sum of the ARCH and GARCH term tells of the persistent in volatility shocks (Bollerslev & Wooldridge, 1990). The significance of the ARCH term implies that there is volatility clustering in West African exchange rate, supporting the study of Oseni (2016) that there is the existence of exchange rate volatility in West Africa. The GARCH (1,1) model is not stationary because the model does not satisfy the covariance stationary condition that  $\alpha + \beta < 1$ . Thus, the sum of the terms is greater than one. Also, results from GARCH (1,1) model reveals that the ARCH term (1.2778) and the GARCH term (-0.0134) are all significant, showing there is the presence of overshooting volatility shocks.

The exponential GARCH (EGARCH) parameters are significant at 1% with positive coefficients except the GARCH term which has negative coefficient and statistically insignificant. The significance of the ARCH effect indicates that EGARCH specification is appropriate for modelling exchange rate volatility asymmetry. The

EGARCH is not covariance stationary since  $b$  is highly insignificant. The coefficient of leverage effect term ( $\gamma$  EGARCH) is positive and statistically significant at 1% with the exponential term being 2.8089; meaning that exchange rate has significant asymmetry component of shocks. These points to the fact that good news has leverage effect to increase exchange rate volatility of West African countries than unwelcome news. The sum of the EGARCH parameter is large, indicating that there is persistence of volatility shocks. So good news sends shocks throughout West African countries in general. Therefore, the effect of today's shock is a forecast to the future of the sub-region.

Probing volatility using the threshold GARCH (TGARCH) model; there are two types of news. The good news ( $\mu_t > 0$ ) and bad news ( $\mu_t < 0$ ) have different effects on the conditional variance; i.e., good news is represented by  $\alpha$ , while bad news is represented by  $(\alpha + \gamma)$ . The negative asymmetric effect coefficient shows there is positive shocks. Thus, in this study, good news has an impact of 0.0669 while bad news has an impact of 0.3917. The modelling of events or news are significant determinants of the exchange volatility, inferring that bad news confer higher volatility more than good news of the same magnitude. News effect is asymmetric and is significant at 1% level, indicating the existence of an asymmetric effect in West Africa since  $\gamma \neq 0$ . Result from nonlinear ARCH (NARCH) regression for exchange rates volatility revealed that all the key coefficients have significant coefficients at 1%; with only the  $\gamma$  to be significant at 1% level. The covariance is stationary because it is lesser than 1. In selecting the best model, Wald  $\chi^2$ , the P  $\chi^2$ , log likelihood statistics, and the level of persistence of the model are estimated and compared for all the specified models and the EGARCH is found to be the best fitting for West Africa in this study.

#### 4.4.2 Drivers of Exchange Volatility in Francophone and Non-Francophone

##### ECOWAS Countries

**Table 4.5 Drivers of Exchange Rate Volatility in Non-francophone Countries-Aggregate Estimates**

Parameter	GARCH	TGARCH
C	-0.0267(0.0203)	-0.02723***(0.0065)
Log-ER <sub>it-1</sub>	1.0106***(0.0017)	1.0110***(0.0005)
IF <sub>it</sub>	0.0024***(0.0015)	0.0024***(0.0005)
C	0.0521***(0.0040)	0.0087***(0.0006)
$\alpha$	0.1557***(0.0270)	0.2314***(0.0836)
$\beta$	-0.6059***(0.0040)	-0.007(0.0045)
$\Upsilon$		3.6889***(0.2252)
$\alpha+\beta$	-0.4502	0.2244
$\alpha+\Upsilon$		3.9203
Number of Obs	934	934
Wald $\chi^2$	442035.66	4540000
P $\chi^2$	0	0
Log likelihood	243.9226	419.1319

Source: Author's Construct (Fieldwork 2023)

Note: \*\*\*, \*\* and \* are significant level at 1%, 5% and 10% respectively.

Values in () are robust standard errors.

**Table 4.6 Drivers of Exchange Rate Volatility in Francophone Countries-Aggregate Estimates**

Parameter	GARCH	EGARCH
C	2.8604***(0.1492)	3.0817***(0.1333)
Log, ER <sub>it-1</sub>	0.5475***(0.0238)	0.5117***(0.0211)
IF <sub>it</sub>	-0.0019***(0.0004)	-0.0016***(0.0004)
C	0.0032***(0.0009)	-6.2940***(0.1040)
$\alpha$	-0.1358***(0.0169)	-0.2549***(0.0452)
$\beta$	0.4972***(0.1806)	182.581***(20.5304)
$\Upsilon$		-0.1968***(0.0660)
$\alpha+\beta$	0.3614	182.3261
Number of Obs	1,065	1,065
Wald $\chi^2$	547.25	602.08
P $\chi^2$	0	0
Log likelihood	1330.076	1368.829

Source: Author's Construct (Fieldwork 2023)

Note: \*\*\*, \*\* and \* are significant level at 1%, 5% and 10% respectively.

Values in () are robust standard errors.

To answer objective two, the study compared francophone (Table 4.6) with non-francophone (Table 4.5). It was seen that francophones have negative coefficients for inflation on exchange rate volatility while non-francophone has positive coefficients for inflation; though all are statistically significant at 1% for all ARCH regression models employed in this study. This means that *ceteris paribus*, for francophone countries, as inflation is dropping, exchange rate volatility increases because there are low natural resource endowments, unrestricted capital movement throughout the CFA area, collective credit, and monetary policies in such countries. Thus, inflation is a negative significant determinant of exchange rate volatility in the francophones. This result is expected given the pegged nature of the exchange rate regime. Consequently, an increase in inflation has the power to decrease fluctuations in exchange rate which is not supported economic theories.

Meanwhile for non-francophone countries, all other things being equal, a rise in inflation might have a positive potential on exchange rate volatility depending on the macroeconomic conditions because the currencies are flexible. This occurrence in non-francophone countries is strongly supported by literature. It is safe to say that increased exchange rate volatility brings about import-driven inflation in the non-francophones. The coefficients of the constant variance term of non-francophone countries are negative while francophone countries are positive though statistically significant for all models meaning the average exchange rate volatility of non-francophone has a negative significant impact while francophones have positive significant impact because fixed exchange rates are believed to reduce real exchange rate volatility. This can be argued on basis that there is high level of interaction with France and this relationship might constitute a diversion in normal patterns.

It can be observed that a past exchange rate volatility can cause an increase in current exchange rate of francophone countries and non-francophone countries at a level of 1% significant level *ceteris paribus*. For both, it is seen that the lag of exchange rate volatility has high coefficients, so it has the most positive impact on exchange rate volatility increases. Thus, a volatility in exchange rate presently is influenced by a preceding exchange rate volatility because of common prevailing macroeconomic conditions as there is geopolitical risks and threats amongst the countries. Therefore, past volatility in exchange rate has a significantly strong predictive power on current volatility in exchange rate. Also, this could be because the CFA is pegged to the euro but is flexible against the U.S. dollar. Again, looking at the volatility coefficients; it can be realized that the non-francophone is characterized by higher coefficients of exchange rate volatility.

For this category, the study considered the common model which is GARCH for this study. The GARCH (1,1) model is stationary because the model satisfies the covariance stationary condition that  $\alpha + \beta < 1$  for both francophone and non-francophone countries. For non-francophone countries, results from GARCH (1,1) model reveals that the coefficient of ARCH term is positive and significant at 1% level, while coefficient of the GARCH term is also significant at 1% and negative. While the result from the francophones shows that the ARCH term (0.1358) is also significant but negative with the GARCH term of 0.4972 is significant at 1% level and positive. Therefore, there is volatility clustering in both division whiles the positive ARCH term of non-francophones infer that a positive shock on its exchange rate could increase the next period conditional variance than a negative shock. The ARCH term estimates of GARCH model for francophones are not close to zero whiles that of non-francophones are close to zero. This suggests that there are

differences in economic capacity as the non-francophones have an open economy than the francophones. Thus, the more open an economy is, the less costly is the decision to surrender the domestic currency. This also shows the extent of shocks and cycles including the eventual existence of fiscal transfers on countries. Therefore, this study concludes that exchange rate regimes influence the fluctuation in the exchange rates.

#### **4.5 The Terms of Trade, Institutional Quality and Exchange Rate Volatility in the ECOWAS**

This section of the study examined the relationship between the terms of trade and exchange rates considering the moderating role of institutional quality. The PARDL model was applied as the variables are found to be integrated of same order. The study considered the necessary groupings existing in the sub region of ECOWAS. Three techniques were employed which are pool mean group (pmg), mean group (mg) and dynamic fixed effect (dfe); through the application of a Hausman test with probability chi2 of 0.9988, it is discovered that the pool mean group is the most preferred for this research. The pmg combines averaging and pooling, permits the error variances, intercept, and short-run coefficients to differ across panel units, while constraining the long-run coefficients to be homogenous across the spatial dimension (Pesaran et al., 2001). Thus, it depicts the true characteristics and generates relatively more consistent and reliable average estimates by providing the long- and short-run empirical estimates simultaneously. Thus, pmg can generate results for all however, for oil-producing francophone countries, dfe was applicable.

Thus, this study follows the steps of Abaidoo and Agyapong (2022) so, applies PCA. With a scale reliability coefficient of 0.9517 through Cronbach's alpha, which is a desired standard outcome; the study captures a composite index of the six variables

using PCA approach which has been extensively applied in literature. PCA procedure ensures unbiased results and not suffering from insufficiencies of equal assigned simple weights (Abaidoo & Agyapong, 2022). The indicators used for the index are of equivalent measure. Principal components (eigenvectors) and Kaiser-Meyer-Olkin measure of sampling adequacy are reported in the appendix. Ten models are generated to demonstrate the role of the individual institutional quality indicators, the aggregate, and the moderating role of institutional quality. All the variables are integrated at first order so, it is important to find out the cointegrating relation among the variables by the use of Koa test (1999); that proves the existence of long-run relationship among the variables as reported in the appendix. Koa Test was applied because this is a panel data. Cross sectional dependence test was also applied on the models specified using Breusch-Pagan LM, Pesaran scaled LM and Pesaran CD. The result reported in the appendix section, exhibits cross sectional dependence exist for all the models. Again, the measure of variance inflation factor (VIF), shows that there was no issue of multicollinearity existing in the models because no recorded values exceeded 10. Also, reported probability value of heteroscedasticity from the Breusch-Pagan / Cook-Weisberg tests for heteroskedasticity and Ramsey tests exceeded the 5% significance level as reported in the appendix. A pictorial representation of the relationship between the exchange rate and other variables was reported in the appendix.

#### ***4.5.1 The ECOWAS Outlook of the Terms of Trade, Institutional Quality and***

##### ***Exchange Rate***

The result on ECOWAS as objective three; showed that the models are statistically significant and with mixed consequence on exchange rates as shown in Table.4.7. The ECMs for all the models had negative coefficients and more importantly less than one as required though not all is statistically significant. This symbolises the swiftness of

recovery to long-run equilibrium. Most of the variables in short-run results which is reported in the appendix, are statistically insignificant meaning in the interim they do not hold any significant impact on exchange rates fluctuations confirming purchasing power parity theory of one price existing in ECOWAS in the interim.

For the ECOWAS sub-region, all the indicators of institutional quality have negative significant impact on exchange rate returns except regulatory quality that has positive significant impact as seen in models (1) to (6). In effect, control of corruption has a reducing effect while regulatory quality has an increasing effect on exchange rate returns. The institutional quality index is introduced in model (7). These results in enabling institutional quality index, the terms of trade, GDP, and debts service to exert negative significant impact on exchange rate returns while financial development and external debts remains insignificant in the long run. Thus, this relationship of institutional quality index ensures stability in as purported in studies by North (1993); Forson, 2016. Thus, the study highlights as in objective (3) the link that institutional quality has negative significant impact on exchange rate in ECOWAS. These occurrences support institutional theory and the classical new institutional theory and highlights that quality institutions play key roles in determining the stability of the macroeconomic variables so; nations should pay thorough consideration to empowering such.

With the introduction of interaction of institutional quality on institutional quality as seen in model (8), all the variables in the model were statistically significant at 1% level in long-run with negative coefficient. Also, the interaction of institutional quality on financial development has significant relationship on GDP, the terms of trade, external debts, and the interaction itself, as seen in model (9). Surprisingly,



institutional quality and financial development were insignificant with positive coefficients when financial development interacted with institutional quality. This means that poor infrastructural and institutional developments might contribute to higher exchange rate fluctuations in the countries. This shows that efficient and effective institutional interventions are needed to improve the economies competitiveness by make compelling strategic policies to address, control and prevent any currency issues and instabilities as published by Dada (2020). However, the interaction of terms of trade on institutional quality by way of the sub-region having comparative advantages in natural resources surprisingly; did not produce the expected results as the interaction resulted in statistically insignificantly for all the other variables in that model, (10). The reason for these insignificance interactions might be because the region is still developing and is proportionally disadvantaged, coupled with the prevailing high political instability. It can be observed that the interaction of quality institutions has its effects and direction on how procedures affect the factors of currency uncertainty in the long-run especially in West Africa as has been established.

The result of this study further shows that financial development had mixed results. Also, financial development moves together with institutional quality in the long-run; such that in models (3), (4), (5), (6) (7) and (8), both variables were negative whiles in model (1), (9) and (10), both were positive thus supporting a publication of Abaidoo and Agyapong (2022). In the short-run, financial development does not have a significant effect on exchange rate because all the models are statistically insignificant with positive coefficients. This might be because of cumbersome bureaucracy, unsuitable and inadequate infrastructure. Also, financial development comes at an extra cost with unequal opportunities which explains why exchange rate might

increase when the financial development is increased. Moreover, financial development does not consider the democracy of a country; whereas most West African countries have challenges with democracy.

GDP and the terms of trade are dynamic variables as trade is a major contributor to GDP growth and the sub-region imports more commodities than they export; including the issue of larger undiversified exports; thus, a deficit trade balance reduces GDP. It is important to note that the per capita GDP are relatively low because profitable opportunities have not been fully and properly utilised. In most of the models, GDP is statistically significant with negative coefficients in long-run meaning that a 1% increase in exchange rate will decrease the GDP of the countries in the long-run while the short-run has mixed results. Thus, exchange rate has strong significant impact on the development of ECOWAS sub-region as purported in studies of Doan (2019); Aghion et al., (2009); Omojimite and Akopkodje (2010).

Similarly, the terms of trade had the most negative coefficients in the long-run. According to classical theories of trade, such as comparative advantage theory, there is more trading activities in the sub-region and leads to the exchange of technology, efficient allocation of resources, access to new markets, transfer of knowledge and redistributes income. In the interim, a depreciated currency makes export cheaper thus more will be exported; whereas imports become more expensive in so doing decreases it, concurrently; leading to reduced trade imbalance as underpinning the theory of the Marshall Lerner Condition but in the long-run exchange rates; affirming the studies by Rajković et al. (2020) and Qiu et al. (2019). This situation implies that exchange rate variations affect growth by affecting the competitiveness of the exports and imports. The influence of exchange rates on trade and GDP is negative within West

African countries where there are no forward exchange markets. This suggests that GDP determines the volume of demand of goods and services, and this is like a study of Rajkovic (2020).

Institutional quality index has mixed impact on exchange rates because there are incidences of higher level of corruption, ineffectiveness, autonomous challenges, political interference, and instability perception linked with institutions in the sub-region which is detrimental to robust institutional quality. This confirms a study by North (1991) that there are humanly constraints and restricted political drive as the value of a currency is set by the interactions and power of different actors of the currency market supervised by the central banks as implied by Forson (2016). External debts and the debts services have mixed results depicting that, these variables depend on the prevailing economic strategies and conditions as seen in a report of IMF (2022). Thus, external debts and debts services can only affect exchange rate depending on terms of trade and the level of institutional quality on exchange rate of the countries involved. According to this result, the external debts and services can significantly influence exchange rate when the terms of trade and institutional quality have significant impacts on exchange rate.

**Table 4.7: Long-Run Results on the Terms of Trade, Institutional Quality and Exchange Rate in ECOWAS**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
FD	3.7556 (2.6148)	2.826*** (0.2157)	-6.7056* (3.9589)	-7.2124** (3.1305)	-5.0824* (2.7565)	-6.156 (6.1409)	-9.3646 (5.9592)	-4.8076*** (1.972)	0.2431 (2.6207)	15.2296 (12.0005)
IQ							-1.3256*** (0.4097)	-0.7675*** (0.0847)	0.0944 (0.2902)	1.3624 (2.2016)
RQ	2.8276*** (1.1675)									
CC		-1.8293*** (0.0363)								
GE			-7.8052*** (1.7816)							
PS				-1.1773** (0.5076)						
PS					-1.016** (0.5049)					
VA						-3.1575*** (1.0655)				
Log-GDP	-1.4826*** (0.3375)	-0.0604*** (0.0207)	-0.3421 (0.3161)	0.5326** (0.2569)	0.5718*** (0.2357)	-1.6237*** (0.5153)	-1.4541*** (0.5753)	-0.7998*** (0.1557)	-0.5753** (0.2566)	-0.4442 (2.0353)
Log-TT	0.1291 (0.1974)	-0.3968*** (0.0212)	-0.328 (0.2469)	-0.1447 (0.2031)	0.643*** (0.2359)	-0.6148 (0.454)	-1.2815*** (0.4595)	-0.8023*** (0.1541)	0.3812* (0.2322)	-1.5582 (1.3272)
Log-ED	-0.3005*** (0.1073)	0.2448*** (0.0121)	-0.0547 (0.1392)	0.1113 (0.0986)	0.1497* (0.0793)	-0.1748 (0.1593)	0.0256 (0.1941)	-0.2589*** (0.0856)	-0.1895** (0.0955)	0.3454 (0.9748)
Log-DS	-0.4704 (1.2184)	0.745*** (0.1395)	-4.046*** (1.8998)	-0.0323 (1.0669)	-1.0812 (0.9146)	-5.7473* (3.3965)	-8.2685*** (3.2943)	1.1829 (0.832)	0.3665 (1.0714)	8.1448 (10.1749)
IQ*IQ								-0.6654*** (0.1197)		
IQ*FD									-7.5726*** (2.5888)	
IQ*TT										0.0112 (0.0279)
Cons	3.5926*** (0.8680)	-0.0412 (0.0872)	2.83* (1.6932)	-0.493* (0.3021)	-1.28** (0.5497)	5.4584*** (1.8478)	3.542* (0.2147)	1.7823 (1.2445)	0.6218* (0.3232)	6.5336 (11.6359)
ECM	-0.3181*** (0.7437)	-0.0183 (95.4806)	-0.1936* (0.1191)	-0.2344* (0.1384)	-0.2883** (0.1248)	-0.1974*** (0.069)	-0.1073*** (0.06)	-0.1713 (0.1522)	-0.2268 (0.1503)	-0.9858 (0.8569)
Obs	276	276	276	276	276	276	276	276	276	276
Countries	15	15	15	15	15	15	15	15	15	15
Min Obs	15	15	15	15	15	15	15	15	15	15
Avg Obs	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4
Max Obs	19	19	19	19	19	19	19	19	19	19
Years	21	21	21	21	21	21	21	21	21	21

Source: Author's Construct (Fieldwork 2023)

Note: \*\*\*, \*\* and \* are significant level at 1%, 5% and 10% respectively.

Values in () are robust standard errors

#### ***4.5.2 Comparison Analysis of Exchange Rate Regimes and Oil Extraction Capacity of Terms of Trade, Institutional Quality and Exchange Rate in the ECOWAS***

The study finally in achieving objective (4), assessed the oil-producing francophone with non-oil producing francophone countries and oil-producing non-francophone with non-oil producing non-francophone countries. Comparing Table 4.8 and Table 4.9, oil-producing francophone countries with non-oil francophone countries; it can be said that in all the models, many of the variables had insignificant impact on exchange rate returns of oil-producing francophone countries in both periods. Whiles for non-oil producing francophone countries, many of the variables had insignificant impact on exchange rate returns in the short-run. The short run tables are reported at the appendix. However, in the long-run of same, control of corruption and government effectiveness has significant negative impact on exchange rate returns; supporting institutional theory. Also, the interaction between financial development and institutional quality had a positive significance in the long-run of oil-producing francophone countries which yielded a positive impact of financial development and a negative impact of institutional quality index on exchange rates confirming the new institution theory.

The terms of trade, as seen in the non-oil-producing francophones seems to have predominantly negative coefficients. This is because exchange rate movements have been alleged to have adverse consequence on trade as it increases the riskiness of trading through uncertain adjustment costs and negatively affects the optimal allocation of resources. However, it is also known that higher risk implies higher returns. So, studies have contradicting views such that Bostan et al (2020); Yakub et al (2019) report that an increase in exchange rate volatility negatively affects trade;

while Lin (2012), report no overall trade effects. Furthermore, non-oil producing francophone countries, it is notable that GDP is influenced by the terms of trade.

With regards to institutional quality, there are predominantly negative coefficients in both divisions, though fairly insignificant. Most of the variables are not statistically significant in the both the periods for all the models for oil-producing francophone countries because of revenue from the oil deposit, coupled with pegged exchange rate regimes. This means that there are no changes in the conditions of international trade; the conditions remain the same as in purchasing power parity theory. Thus, the exchange rate regime of the francophone countries which is fixed makes the forces of the domestic market not to influence prices, irrespective of the trading potential of the countries involved. Also, the price of oil is universally determined hence oil price may not influence exchange rate movement. In fact, a study of Beckmann et al. (2020) considers three direct transmission channels of oil prices to exchange rates and it include the terms of trade channel, the wealth effect channel, and the portfolio reallocation channel.

Most importantly, there is a linkage between global oil price volatility and currencies of countries in which they are traded because of the transmitting power of the said commodity along the supply chain, as suggested in a study by Troster al et. (2019) which it not in this case because the oil is traded in US dollars. Therefore, management of exchange rates can be ineffective and not resilient as the oil-producing francophone countries are not allowed to improve their trade by means of the exchange rate, yet exchange rates are considered in trading of goods. Generally, the coefficients for oil-producing countries are greater than that of non-producing countries displaying comparative advantage theory because there are more trading

activities. Thus, like a study of Gnanon (2023) higher exports result in greater inclusiveness. Majority of the ECM is statistically significant for non-oil producing francophones. Francophone countries with their pegged exchange rate regimes induce a certain amount of discipline but this inevitably slows down productivity. Thus, the pegged exchange rate influences the performance of the macroeconomic variables. Also, the pegged exchange rate maybe preferably reliable as the sub-region is considered to have high corruption, democratic issue, weak institutions, lack accountability, political interferences, and instability.



**Table 4.8: Long-Run Results on the Terms of Trade, Institutional Quality and Exchange Rate in Oil-Producing Francophone Countries in ECOWAS**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
FD	40.1162 (948.668)	156.8821 (3096.061)	-30.1683 (110.441)	6.6838 (94.99)	-4.3594 (58.637)	-30.8562 (29.533)	-30.1684 (110.4414)	-34.9309 (128.684)	46.9958*** (16.7814)	62.6039 (151.79)
IQ							-2.1697 (8.643)	-3.21278 (12.176)	-8.6144*** (3.3096)	-8.818 (17.9653)
RQ	2.5009 (160.66)									
CC		251.3223 (4432.31)								
GE			-13.7588 (54.807)							
PS				-15.7466 (48.46)						
RL					27.2865 (48.1367)					
VA						25.6273 (18.0531)				
Log-GDP	44.5708 (702.043)	156.1747 (2807.4)	-13.3665 (36.3546)	-5.771 (14.288)	6.7993 (20.12)	7.702 (8.607)	-13.3665 (36.3548)	-9.90853 (31.8743)	-2.8290*** (1.0035)	-10.4313 (20.0739)
Log-TT	-165.801 (2536.254)	-250.0961 (4500.733)	34.7675 (95.586)	30.0041 (60.96)	-16.311 (46.524)	-2.8954 (8.9305)	34.7675 (95.5869)	47.15491 (146.279)	11.3783*** (2.8077)	-5.8822 (30.6210)
Log-ED	6.6406 (123.6767)	120.2608 (2146.337)	-8.0793 (22.531)	-5.14 (10.57)	9.2235 (19.781)	5.8803 (5.3767)	-8.0793 (22.5315)	-16.1407 (49.3038)	-0.1907 (0.5297)	9.0958 (19.8688)
Log-DS	126.648 (2027.602)	183.7044 (3369.8)	-49.3712 (162.012)	-64.5745 (152.008)	28.9561 (92.834)	-8.5203 (20.999)	-49.3713 (162.0221)	-134.023 (462.218)	-9.4102 (5.9565)	50.8653 (147.8794)
IQ*IQ								7.220068 (23.3957)		
IQ*FD									61.8389*** (20.4704)	
IQ*TT										0.1624 (0.3155)
Cons	3.8219 (24.154)	-23.8533 (23.798)	-14.46411 (26.929)	-16.7104 (30.109)	-23.391 (27.295)	-28.919 (21.758)	-13.8713 (26.9166)	-36.1111 (33.8028)	21.0175 (14.3556)	-11.4003 (24.4377)
ECM	-0.0282 (0.422)	-0.0254 (1.2768)	0.174 (0.5118)	0.2559 (0.5583)	-0.3048 (0.7272)	-0.5942 (0.6299)	0.174 (0.5118)	0.1732 (0.5524)	1.2128** (0.508)	-0.2473 (0.5286)

Source: Author's Construct (Fieldwork 2023)

Note: \*\*\*, \*\* and \* are significant level at 1%, 5% and 10% respectively.

Values in () are robust standard errors.



**Table 4.9: Long-Run Results of the Terms of Trade, Institutional Quality and Exchange Rate in Non-oil Producing Francophone Countries in ECOWAS**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
FD	4.0025 (6.9025)	2.8118*** (0.218)	-1.1604 (7.0395)	-2.6549 (7.364)	-0.5862 (6.5969)	-3.4656 (7.9958)	-0.739 (6.8967)	5.412 (5.5448)	4.441 (5.7388)	-2.4461 (4.261)
IQ							-0.4561* (0.2740)	0.1616 (0.2104)	-0.1649 (0.6016)	-0.3535 (0.2524)
RQ	1.9712 (1.5671)									
CC		-1.8287*** (0.0365)								
GE			-3.0138* (1.7679)							
PS				0.6897 (0.9116)						
RL					-1.6212 (1.0463)					
VA						-1.2565 (0.9792)				
Log-GDP	-1.4237*** (1.5671)	-0.0595**** (0.0209)	1.3201*** (0.4966)	-1.3351** (0.6029)	-1.873*** (0.5567)	-1.371*** (0.536)	-1.315*** (0.4936)	-0.911*** (0.317)	-1.440*** (0.4857)	-1.155*** (0.3609)
Log-TT	-1.523 (0.9753)	-0.3958*** (0.0215)	1.8356** (0.9197)	-2.746* (1.4653)	-1.7168** (0.8164)	-1.8676 (1.2196)	-1.8206** (0.9148)	-0.9721* (0.5446)	-0.9296 (0.6146)	-0.7713* (0.4549)
Log-ED	-0.177 (0.1526)	0.2455*** (0.0122)	-0.3507** (0.1598)	-0.2517 (0.1556)	-0.476*** (0.1711)	-0.3303* (0.1724)	-0.3509** (0.1580)	-0.422*** (0.1050)	-0.2878** (0.1399)	-0.1812 (0.1139)
Log-DS	1.883 (2.3504)	0.7859*** (0.1414)	3.8676 (2.651)	4.01 (2.8653)	4.5615** (2.3615)	2.2981 (3.1991)	3.841 (2.6194)	2.094 (1.7581)	1.3783 (1.7883)	5.474*** (1.946)
IQ*IQ								0.4097*** (0.1539)		
IQ*FD									-1.9935 (5.5383)	
IQ*TT										0.0047*** (0.0016)
Cons	3.9704** (1.7094)	0.0194 (0.1657)	3.8053** (1.6513)	4.329** (1.9425)	4.0733 (1.9324)	4.5557*** (1.7364)	3.4302** (1.5988)	2.3965 (2.1115)	3.6565** (1.56601)	1.2825 (1.065)
ECM	-0.2638*** (0.098)	0.4145 (0.7245)	-0.2466*** (0.0796)	-0.2354*** (0.0868)	-0.216*** (0.2157)	-0.245*** (0.0739)	-0.229*** (0.0757)	-0.1744 (0.1918)	-0.252*** (0.0886)	-0.2433** (0.111)
Obs	131	131	131	131	131	131	131	131	131	131
Countries	7	7	7	7	7	7	7	7	7	7
Min Obs	17	17	17	17	17	17	17	17	17	17
Avg Obs	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7
Max Obs	19	19	19	19	19	19	19	19	19	19
Years	21	21	21	21	21	21	21	21	21	21

Source: Author's Construct (Fieldwork 2023)

Note: \*\*\*, \*\* and \* are significant level at 1%, 5% and 10% respectively.

Values in () are robust standard errors.

To conclude, the study looks at oil-producing and non-oil producing non-francophone countries. It can be noticed in Table 4.10 and Table 4.11 that oil-producing and non-oil non-francophone countries have different economic setting though they all have floating exchange rate regimes. Just like the oil-producing francophones, it can be observed that majority of the variables in non-oil producing non-francophone countries are statistically insignificant in the long-run and short-run (appendix). However, the introduction of institutional quality index had a positive impact on exchange rate in the long-run. Meanwhile many of the variables are statistically insignificant in long-run (appendix) for oil-producing non-francophone countries. Thus, oil-producing non-francophones have institutional quality to be effective in short-run but ineffective in the long-run. This demonstrates that the amount of trading activities influences exchange rate movements. Thus, the economic environment determines the ability of countries to respond to shocks within certain time limits before strategising to tackle such changes and this evident in this study. The flexibility of the exchange rate regimes which influences the volatility plays major factor as established by Alper (2018).

Financial development in the short-run has positive coefficients for oil non-francophones whiles there is a mixed results for non-oil producing non-francophones countries. It can therefore be deduced that; trading promotes the introduction of advanced practices such as financial technological enhancements that helps to shape the economy as proposed by the comparative advantage theory. Also, the mixed results highlight the low narrowly developed existing financial market in the region. Thus, the level of financial development influences the exchange rate fluctuations depending on the nature of the macroeconomic setting (Aghion et al., 2009). Interestingly, institutional quality index has a mixture of positive and negative

coefficients for both categories; which might be because of institutions having inadequate funds, unsustain policies, political will-power and general weak institutions including prevailing unfavourable socio-economic conditions in the sub-region. Specifically, there were mixed result in non-oil non-francophones with the oil-producing predominantly having more negative coefficients. Unlike the francophones, it can be observed that financial development had no bearing for institutional quality in this division. This can be explained by the high corruption practices, political interferences, feeble institutions, and low human resources as proposed by the new institutional theory and established by North (1993). There is generally low institutional quality as suggested by World Bank (2019).

The interactions between institutional quality on institutional quality and financial development had insignificant bearings on exchange rate returns for both categories as observed in models (8) and (9) though the results were mixed; showing the ineffectiveness of institutions and its interventions to moderate exchange rate returns. However, in (10), it is seen that the introduction of an interaction between institutional quality on the terms of trade poses a significant negative impact for oil-producing non-francophone countries as all the other variables except financial development become statistically significant in the long-run. This shows that interventions and policies on trade are effective to ensure sound trading environment. The negative impact of the interactions is in support of Duodu and Baidoo, (2020). In this case, financial development, the terms of trade and debts services have negative impact on exchange rate returns whiles GDP and external debts have positive relationship with exchange rate returns. Nevertheless, the terms of trade having a negative impact on exchange rate poses a detrimental impact on economic growth as claimed by Alagidede and Ibrahim (2016). Whereas this same interaction does not produce any

significant impact on non-oil non-francophones because of low trade openness hence there is low exchange of knowledge, skills, or developments.

Voice and accountability indicator is statistically significant for oil-producing non-francophones in the long-run and for non-oil non-francophones it is significant in the short-run demonstrating that communication design is essential (Candain et al., 2023). Also, in the short-run oil non-francophones; control of corruption and government effectiveness are statistically significant. GDP has negative impact on exchange rate returns in all periods for oil-producing non-francophones whiles, for non-oil producing non-francophone countries; there is a negative relationship in the short-run but a mixed impact in its long-run. Thus, Katusiime et al. (2016) discovered that the unstable exchange rate influences GDP positively whiles Khobai et al. (2018) also found that exchange rate negatively affected GDP. In oil-producing countries, growth is propelled by external demand, part of which is reflected the in global demand. Consequently, GDP is influenced based on the economic setting of the countries. Obviously, trading leads to specialisation and a rise in economic growth, as a result the theory of comparative advantage thus, there are more significant variables in the short-run of oil-producing non-francophones countries run because oil prices respond quickly to shockwaves before any adjustment are made. Thus, the Marshall Lerner condition is applied in the long-run after the adjustments. This is confirming the finding of Khobai et al. (2018). Also, the revenue from oil exports a useful policy instrument in stabilising the economy in the long-run.

Correspondingly, the external debts mixed has results in long-run and mostly negative coefficients in the short-run while debts services had positive coefficients in both the long and short run periods of oil-producing non-francophone countries. Then for non-

oil-producing non-francophone countries, debts service has positive coefficients in the short-run. This may be because there are different economic needs and positions which varies over time. The findings reveal that the models are positively significant with negative Error Correction Terms, which are less than one and statistically significant at 1% for oil-producing non-francophones; while for the non-oil non-francophones the models have mixed results and the ECM are fairly significant with both negative and positive coefficients. Thus, the oil-producing non-francophones countries ensure long-run equilibrium convergence in all the models.



**Table 4.10: Short-Run Results of the Terms of Trade, Institutional Quality and Exchange Rate in Oil-producing Non-Francophone Countries in ECOWAS**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
ΔFD	5.8278 (6.4374)	3.8376 (4.3721)	4.599 (5.2469)	3.3009 (4.2464)	4.2976 (4.8016)	3.7713 (4.2765)	4.5992 (5.2469)	4.9899 (5.5747)	104.8504*** (41.05)	5.0584 (5.8291)
ΔIQ							-1.1026*** (0.0952)	-7.6897 (6.1094)	-3.3171 (17.8605)	5.4312 (4.5167)
ΔRQ	0.3553 (11.1691)									
ΔCC		-3.533* (1.8947)								
ΔGE			-6.9917*** (0.604)							
ΔPS				-7.0564 (11.1192)						
ΔRL					0.1428 (4.2546)					
ΔVA						-2.4668 (3.1584)				
ΔLog-GDP	-1.3581 (1.252)	-0.4753 (0.7312)	-0.6161* (0.3688)	-1.2049 (1.2346)	-1.2233 (0.4592)	-1.4826*** (0.2402)	-0.6161* (0.3688)	0.5403 (0.9166)	-1.852 (1.1779)	0.5581*** (0.1825)
ΔLog-TT	-1.5829 (2.0329)	-0.6360** (0.3112)	-1.2510* (0.7002)	-1.0773 (0.9827)	-1.4803 (0.9909)	-1.5133 (1.2947)	-1.2511* (0.7002)	-0.8906* (0.4674)	-1.8724 (2.425)	5.3757 (7.2837)
ΔLog-ED	-0.0437 (0.1684)	0.7394 (0.0674)	0.6907*** (0.0692)	0.4259 (0.7170)	0.6847*** (0.0568)	0.4695** (0.2385)	0.6907*** (0.0692)	2.0548 (1.3486)	1.2247 (1.1225)	1.9034*** (0.5128)
ΔLog-DS	23.0902 (22.2914)	39.9685 (42.4134)	27.434 (31.8139)	32.4336 (33.6261)	29.3189 (32.3156)	22.1152 (26.2259)	27.4348 (31.8139)	25.1935 (28.2252)	31.3926 (23.7888)	13.7563 (19.4478)
ΔIQ*IQ								2.041 (2.6526)		
ΔIQ*FD									0.8702 (96.8632)	
ΔIQ*TT										-0.0683 (0.047)
Cons	10.8833*** (3.5713)	16.588*** (5.4774)	16.0378*** (3.1184)	12.63332*** (0.1404)	15.3249*** (2.5741)	23.2717*** (6.3423)	15.2836*** (2.9646)	18.2476*** (4.5003)	29.1647*** (2.9106)	16.811*** (4.3819)
ECM	-0.581*** (0.1964)	-0.3127*** (0.0710)	-0.5691*** (0.116)	-0.4268*** (0.0371)	-0.3326*** (0.0688)	-0.4307*** (0.43068)	-0.5691*** (0.1160)	-0.4942*** (0.1202)	-0.0064*** (0.0004)	-0.4194*** (0.1499)
Obs	38	38	38	38	38	38	38	38	38	38
No of Countries	2	2	2	2	2	2	2	2	2	2
Min Obs	19	19	19	19	19	19	19	19	19	19
Avg Obs	19	19	19	19	19	19	19	19	19	19
Max Obs	19	19	19	19	19	19	19	19	19	19
Years	21	21	21	21	21	21	21	21	21	21

Source: Author's Construct (Fieldwork 2023)

Note: \*\*\*, \*\* and \* are significant level at 1%, 5% and 10% respectively.

Values in () are robust standard errors

**Table 4.11: Long-Run Results of the Terms of Trade, Institutional Quality and Exchange Rate in Non-Oil Producing Non-Francophone Countries in ECOWAS**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
FD	23.7389 (20.6543)	13.2653 (11.858)	-105.894 (180.368)	24.63 (20.0312)	-146.7 (301.65)	-168.3 (204.721)	36.6325*** (5.4156)	18.6876*** (7.4568)	10.3908*** (2.8668)	16.91** (7.107)
IQ							0.4655** (0.2381)	-0.1044 (0.4744)	0.0765 (0.1603)	-0.968 (3.211)
RQ	-1.9052 (3.2184)									
CC		11.2517 (8.44)								
GE			22.9472 (32.16)							
PS				-1.7444 (7.3307)						
RL					-53.3404 (72.8417)					
VA						-35.565 (39.347)				
Log-GDP	-4.4948*** (1.5695)	4.3211 (6.1338)	-18.7703 (20.165)	1.0456 (2.7711)	-15.2006 (23.468)	-7.502 (5.47)	-3.4385*** (0.6542)	0.2606 (0.6993)	0.5699* (0.3511)	0.7356 (0.7385)
Log-TT	0.542 (0.3796)	-0.1942 (0.291)	16.2219 (12.7635)	-1.542 (1.4277)	4.261 (4.076)	-6.3071 (5.906)	1.1545*** (0.4556)	1.4475** (0.6248)	0.3595 (0.2485)	-2.7362 (3.186)
Log-ED	-2.7531*** (0.8374)	0.3405 (1.3258)	-12.0273 (12.2071)	1.0559 (1.7326)	-3.2547 (7.1173)	-1.3277 (1.5058)	-2.9009*** (0.3546)	0.0187 (0.2484)	-0.0658 (0.1681)	0.1608 (1.043)
Log-DS	30.1744*** (11.7575)	-3.194 (8.9556)	36.6678 (33.269)	17.82 (36.19)	-180.698 (180.27)	-5.4188 (44.238)	46.7653*** (7.9325)	2.6767 (3.285)	3.567 (2.325)	22.1179 (24.654)
IQ*IQ								-0.0474 (0.1332)		
IQ*FD									0.3866 (0.7479)	
IQ*TT										0.0459 (0.00635)
Cons	-10.245 (36.908)	38.5642*** (14.239)	18.7128 (9.503)	-18.01 (30.0122)	-12.7231 (41.523)	34.8857 (21.259)	8.7437 (12.7892)	3.3224 (3.7282)	3.7351 (0.2979)	34.0251 (0.00635)
ECM	-0.7771 (0.5766)	-1.0296 (0.7528)	-0.1149 (0.4212)	0.5353** (0.257)	-0.0322 (0.3304)	-0.4831 (0.4708)	0.1301 (0.1865)	0.2169 (0.2551)	0.2561 (0.3266)	-2.1527 (2.57)
Obs	88	88	88	88	88	88	88	88	88	88
Countries	5	5	5	5	5	5	5	5	5	5
Min Obs	15	15	15	15	15	15	15	15	15	15
Avg Obs	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6
Max Obs	19	19	19	19	19	19	19	19	19	19
Years	21	21	21	21	21	21	21	21	21	21

Source: Author's Construct (Fieldwork 2023)

Note: \*\*\*, \*\* and \* are significant level at 1%, 5% and 10% respectively.

Values in () are robust standard errors.

## CHAPTER FIVE

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

#### 5.1 Introduction

Foreign exchange rate management in ECOWAS is a challenge coupled with contemporary international trade disparities that further increases pressures thus, there is the need for a better understanding of these dynamics to employ appropriate management policy enabled by strong independent well-equipped institutions. This section presents the summary of the research outcomes, conclusion, and possible recommendations.

#### 5.2 Summary of the Research

The study estimates the impact of exchange rate on the terms of trade, considering the role of institutional; using panel data spanning from 2000 to 2021 for the fifteen West African countries. This study employs the GARCH models to estimate the exchange rate volatility and PARDL model as techniques to estimate the short, long run parameters and the error-correction mechanism to show the relationship between exchange rate and the other variables.

##### 5.2.1 *The Exchange Rate Volatility in West Africa*

The results demonstrates that inflation, and the lagged of exchange rate have a significant promoting effect on exchange rate volatility in the West African sub-region where there is one pegged exchange regime rate oil-producing country and two floating exchange regime rate oil-producing countries. There is a negative average significant impact on exchange rate volatility; with the previous exchange rate volatility having a greater impact on present volatility than the inflation. It is seen that oil exportation is usually strongly affected by fluctuations in global markets and the



choice of an exchange rate regime is importance for countries where oil is revenue contributes a substantial share of the governmental expenses. Precisely, inflation has a mixed result significant while the lag of exchange rate has a positive significant on general West African countries. Volatility of the exchange rates in ECOWAS is established in the GARCH model by the significance of the ARCH effects and the volatility clustering though not stationary. Again, the EGARCH suggests that good news has the leverage effect to sends shocks throughout West African countries in general. This paper finds considerable evidence that all the asymmetric models establish the existence of a leverage effect for West Africa.

### ***5.2.2 Effect of Exchange Rate Regimes on Exchange Rate Volatility in West Africa***

There is negative average significant exchange rate volatility for non-francophone countries but positive for francophone countries. However, past exchange rate volatility has a positive significant impact on both francophone and non-francophone countries. PPP is a robust theory that predicts movements of floating exchange rates to a high degree of accuracy. Thus, the type of exchange regime of the countries and periods are essential. Additionally, for non-francophone countries, both inflation and the lag of exchange rate have positive significant while for francophones inflation and the lag of exchange rate have negative and positive significant on exchange rate, respectively. Thus, as observed with the PPP, inflation and the lag of exchange rate represent the impact of the predisposition used to predict the movements of the rates.

Also, there is a positive significant ARCH term effect in the GARCH model of non-francophone countries; demonstrating that there is exchange rate volatility existing while francophone countries have a negative significant ARCH term effect. Therefore,

this finding shows evidence that the type of exchange rate regime practiced by a country has power over the level of fluctuations in the rates.

### ***5.2.3 The Moderating Role of Institutional Quality on the Terms of Trade and Exchange Rate Fluctuations in West Africa***

The ECOWAS bloc results from the PARDL shows that the individual indicators of institutional quality exert significant impact on exchange rate returns in the long run, with control of corruption and regulatory quality having the most significant impact on the other variables. This can be attributed to the prominent level of perceived corrupt practices and ineffective regulatory power in the sub-region. Also, political stability has an immediate negative impact on exchange rate and most of the variables in the interim do not hold any significant impact on exchange rates. Also, all the indicators of institutional quality except regulatory quality exert significant negative impact on exchange rate returns in the long run while institutional quality index, financial development, external debt, and debts services have mixed results. GDP and the terms of trade are revealed to exert a predominately significant negative impact on exchange rate returns in the long run. Institutional quality index exert significant negative and insignificant positive impact on exchange rate returns in the long-run. Both interactions of institutional quality on itself and financial development on exchange rate returns are significantly negative in long run period. The terms of trade and financial development has significant negative consequence on exchange rate returns in the long run of ECOWAS.

#### ***5.2.4 The Moderating Role of Institutional Quality on the Terms of Trade and Exchange Rate Fluctuations by Regimes and Capacity in West Africa***

Most of the variables and their interactions for oil-producing francophone have insignificant impact on exchange rate returns. Yet the interaction of institutional quality and financial development had positive significant impact exchange rate returns in the long run making more of the variables to have significant in the long and short run. Explicitly, it enables all the variables except external debts and debts services to have significant impact on exchange rate returns in the long run. In the interim, voice and accountability indicator and GDP have negative significant impact on exchange rate returns in the short-run for non-oil producing francophones. In the long-run of non-oil producing francophone countries, control of corruption and government effectiveness have significant negative impact on exchange rate returns; though relatively statistically significant, GDP, terms of trade and external debts have relatively negative impact while debts service has a positive impact on exchange rate returns.

Additionally, for non-oil producing non-francophones countries the introduction of institutional quality index is significant; with all the other variables were also being significant in the long-run. Majority of the variables are not significant in both long and short run but, GDP and the terms of trade appears to have more significance on exchange rate returns for non-oil producing non-francophone countries in the long-run. Again, in the short-run, voice and accountability indicator has a negative impact on exchange rates returns. Majority of the variable used for this study did not have significant influence on exchange rate returns in the long-run though there were few significant relationships in the short-run of oil-producing non-francophone countries. So, in oil-producing non-francophone countries, some of the variables have short-term

significant on exchange rate returns. GDP and external debts in the short-run of oil-producing non-francophone countries seem to have more significance on exchange rate returns. Notably, non-oil producing francophone countries are swift to recover in the long-run equilibrium while oil-producing non-francophone countries are swift to recover in the long-run equilibrium.

### **5.3 Conclusion of the Study**

Correspondingly, the findings of this research contribute by adding up to literature by scientifically confirming and explaining the role of institutional quality in establishing equilibrium in the terms of trade and exchange rate movement in developing ECOWAS states. To conclude based on the results of this study, the average exchange rate volatility for the ECOWAS region has a negative significant impact which is highly volatile. Inflation is a critical factor on exchange rate volatility of region in general. However, inflation is a positive driver of exchange rate in non-francophone countries while a negative driver for francophones. Then, there is volatility in the exchange rates of non-francophones than francophones because their exchange rate regime provides a shield which reduces their economic vulnerability to exchange rate volatility.

West Africa countries has a record of little product diversity of exports with heavy reliance on extractive products such as crude oil while the imports are more diversified which is deteriorating the terms of trade. The general imbalance of the terms of trade of the sub-region causes the destabilisation of currencies and as a result, reduces aggregate GDP and eventually sinks economic development. Therefore, fluctuations in exchange rates poses severe problem on trade and countries strived to maintain their balance of trade in equilibrium by adjusting their exchange

rates, institutional quality helps to curtail such complications. Therefore, dynamic appropriate strong institutions in exchange rate market are needed to produce counterproductive policy response to ensure economic growth in general. However, institutions and policy intervention are not in their self-own the instrument because their effectiveness depends on the development of infrastructures and systems of the financial environments and consistency of the anticipated macroeconomic policy intervention. Thus, financial development helps in nurturing and enforcing better institutional quality all other things being equal.

Unfortunately, the poor highly insignificant institutional quality and financial development dominating seen in the region has been unhelpful for economic development of the countries. Thus, the result of this study infers that the interaction of institutions quality on other variables by way of interventional policy does extraordinarily little to stabilise fluctuations in exchange rate in most West African countries. This study proves that external debts and debts services influences exchange rate fluctuations because of the associated exchange regimes and economic control of the countries. The result established that oil-producing non-francophone countries face challenges because of volatile oil prices that cause high-low series because of their flexible exchange rate regime, low institutional quality that weakens the governance and autonomous of institutions in the short-run. In effects, the results highlight the fundamental role of institutional quality in achieving appropriate fiscal policies to manage volatile oil expenses.

The pegged exchange rate regime maybe not be idea for oil-producing francophone countries due to the need for interventions and loss of fiscal independence; yet is the best when oil prices are increasing while flexible regimes are preferred when there is

falling oil prices. In effect, oil-producing francophone countries protect their domestic revenues against exchange rate fluctuations whereas oil-producing non-francophones cannot. Institutions quality and their interventions can be used to curb exchange rate unpredictability because it eliminates market distortions caused by information asymmetry, ensures fair and transparent transactions to contributes to industrialisation and trade efficiency.

Therefore, the results conclude that institutional quality help in stabilizing exchange rate in the sub-region all things being equal especially for non-francophone countries. For fiscal prudence, the sub-region must empower its institutions comprehensively to include transparency and fairness because industrialisation does not occur in volatile environments. Thus, ECOWAS states must attempt to be accountable to lessen the likelihood of political instability and conflicts which is quite rampant and disturbing in the sub-region. Based on the results, it can be concluded that the exchange rate is a powerful instrument to better the terms of trade when the indicators of institutional quality are upheld. Therefore, strong institutions are needed to produce counterproductive policy response to stabilize exchange rates. Exchange rate volatility has a direct effect on economies as it a reflection of different activities revolving around that currency so, policy intervention is a key factor to consider.

#### **5.4 Recommendations of the Study**

Inferences from this study offers significant implications for stakeholders in the sub-region including researchers. Thus, there is the urgency to implement timely appropriate and effective fiscal stabilisation policy actions to stem the increasing exchange rate volatility in the sub-region.

As the sub-region is generally developing and poor in nature, it is desirable that the stability in exchange rates is improved through focusing on the dynamic patterns of the exchange rates and economic integration among member countries.

In this regard, this study proposes that West African should improve on the quality of their institutions to capitalize on their intervention policies which will improve on the other sectors of the economy. Therefore, measures that reinforce institutional reforms should be pursued to boost their performance with a view to accelerating economic growth.

Strategic value chains policies should be implemented by identifying distinct challenges of each of the traded commodities to provide a credible view of policy objectives in the region which will be mutually accepted for the growth of the economies.

The fight against corruption, political interference, instability, social violence, reduce administrative bottlenecks and reinforced rule of law, regulatory quality accountability and contract enforcements, and more importantly transparency in both CFA and Non-CFA West African countries should be enhanced. More importantly, government effectiveness, control of corrupt practices and voice and accountability needs a sub-regional level restructuring to ensure stability and discipline.

These findings in this study can be used by governments and policymakers to create a more resilient and sustaining environment; while analysts can make use of this thesis to pursue actions in resourcing their institutions to improve governance in the sub-region. Moreover, this study will be a framework for further studies such as

segregating the institutional quality into levels to find the dynamics which was not detected in this study.





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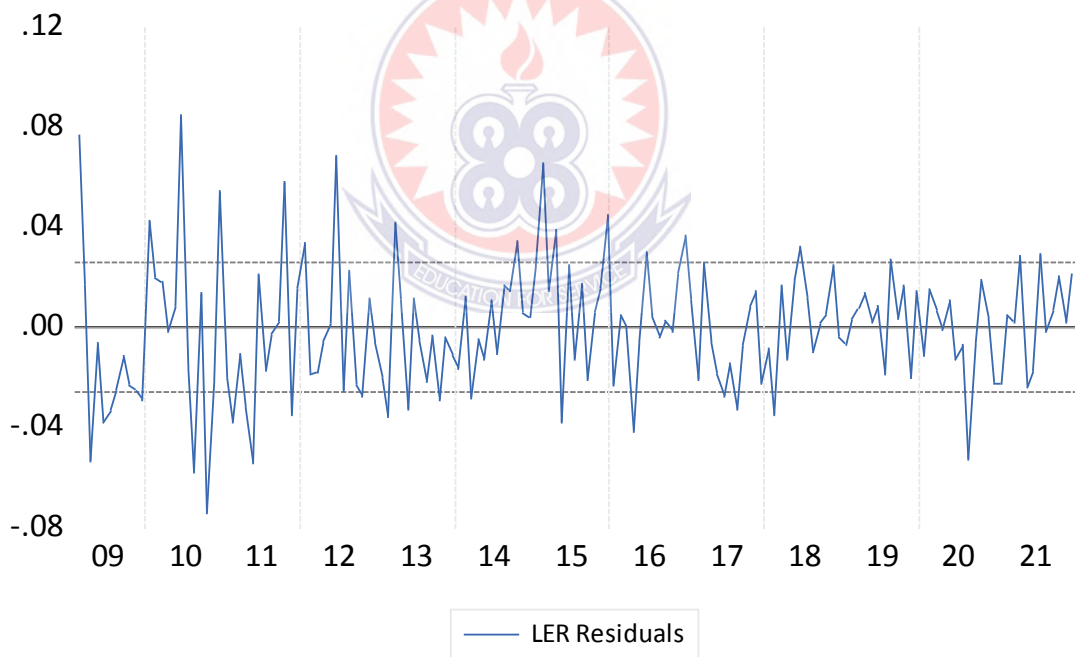
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## APPENDIX A

**Table A4.1 GARCH Diagnostic Test Result**

Test Statistics	ECOWAS	Non-francophones	Francophones
ARCH Effect	0.9296 (0.3365)	0.0108(0.9196)	0.9362(0.3333)
Functional Form	0.2224 (0.6379)	0.6208(0.5357)	0.5174 (0.5971)
Heteroskedasticity	1.8967 (0.1536)	0.9483(0.6224)	3.7739(0.1515)
Serial Correlation	0.6037 (0.5481)	1.5561(0.4577)	1.238(0.5385)
CUSUM	Stable	Stable	Stable

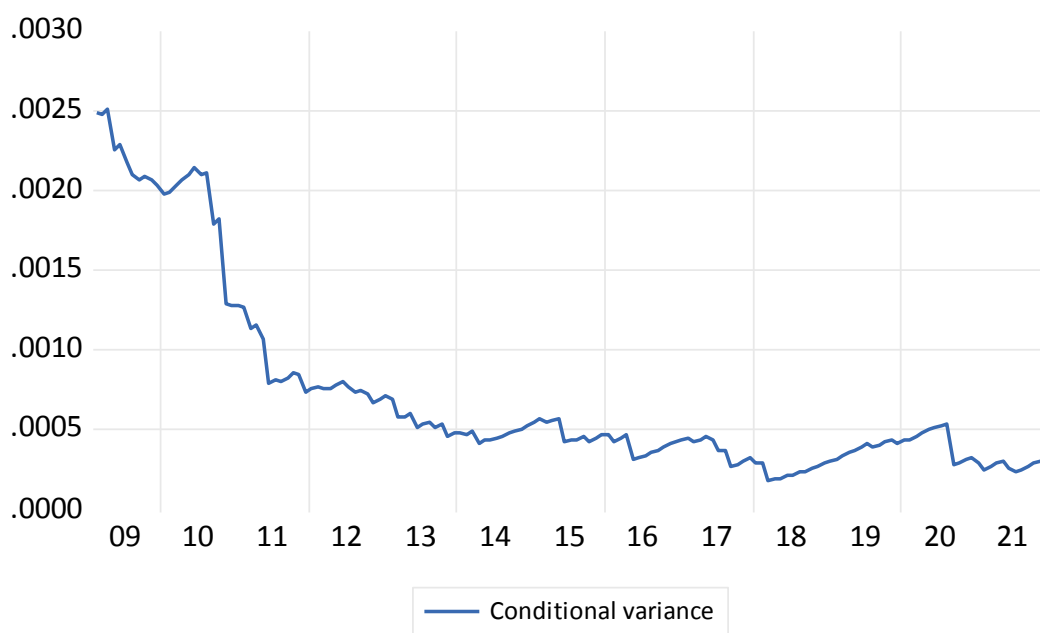
Source: Author's Construct (Fieldwork 2023)  
Probability values are in the parentheses.

**Figure A4.1 Residual Graph of ECOWAS**

Source: Author's Construct (Fieldwork 2023)

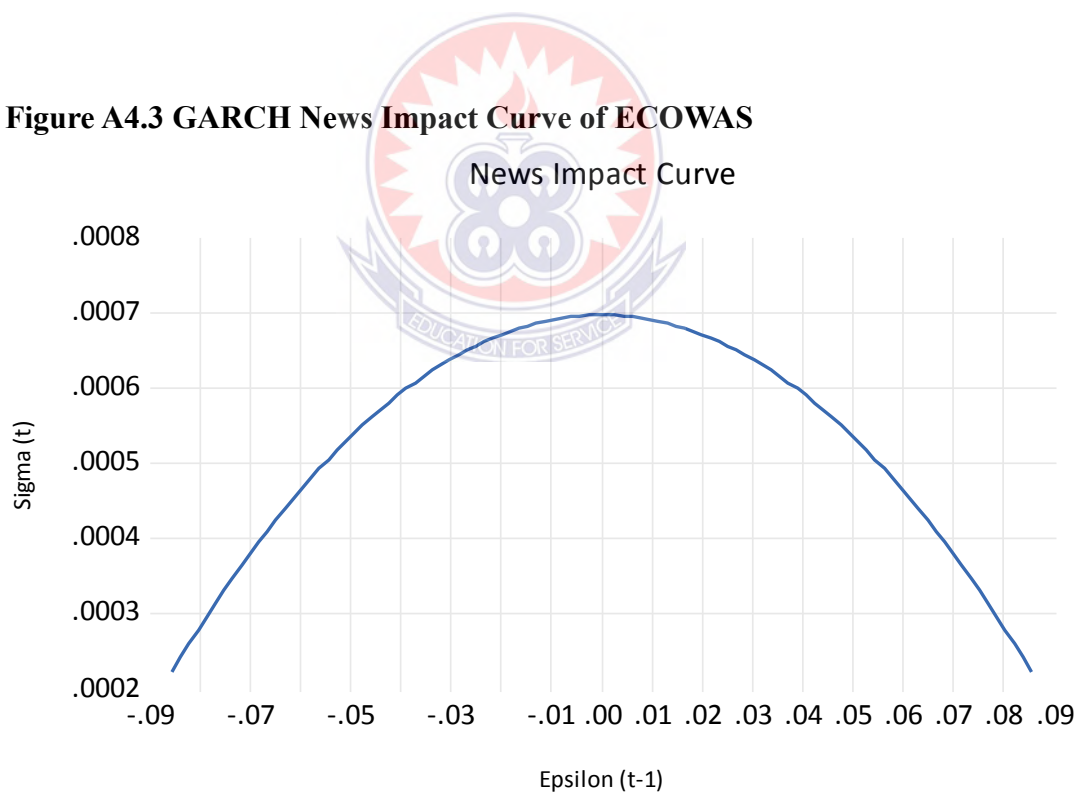


**Figure A4.2 Conditional Variance of ECOWAS**



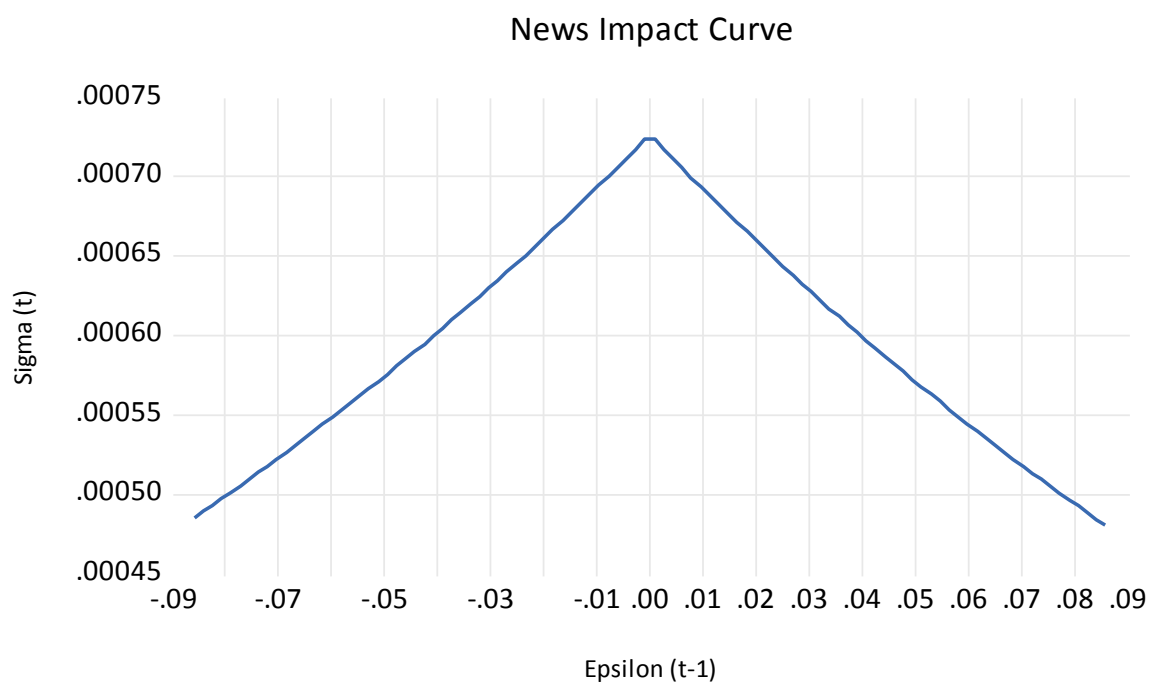
Source: Author's Construct (Fieldwork 2023)

**Figure A4.3 GARCH News Impact Curve of ECOWAS**



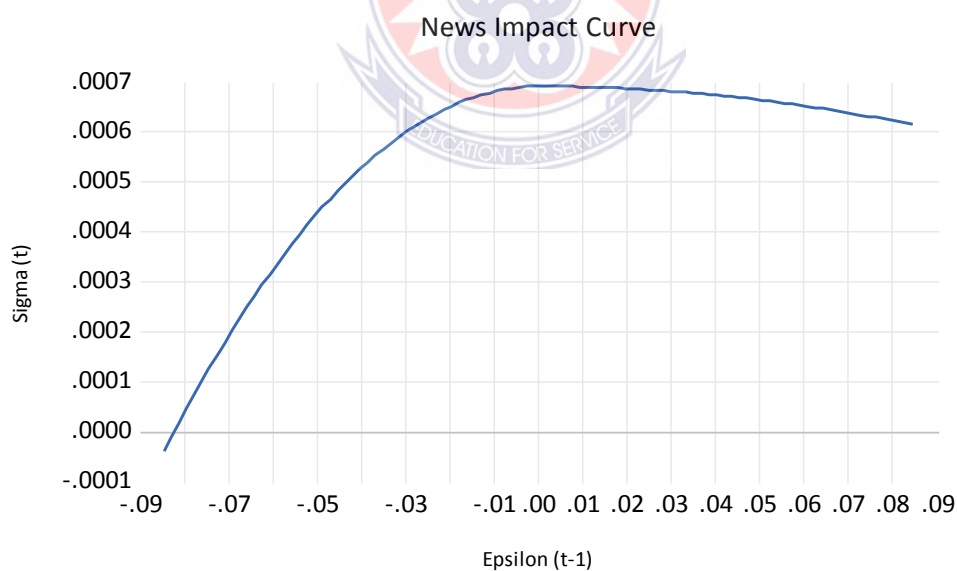
Source: Author's Construct (Fieldwork 2023)

**Figure A4.4 EGARCH News Impact Curve of ECOWAS**



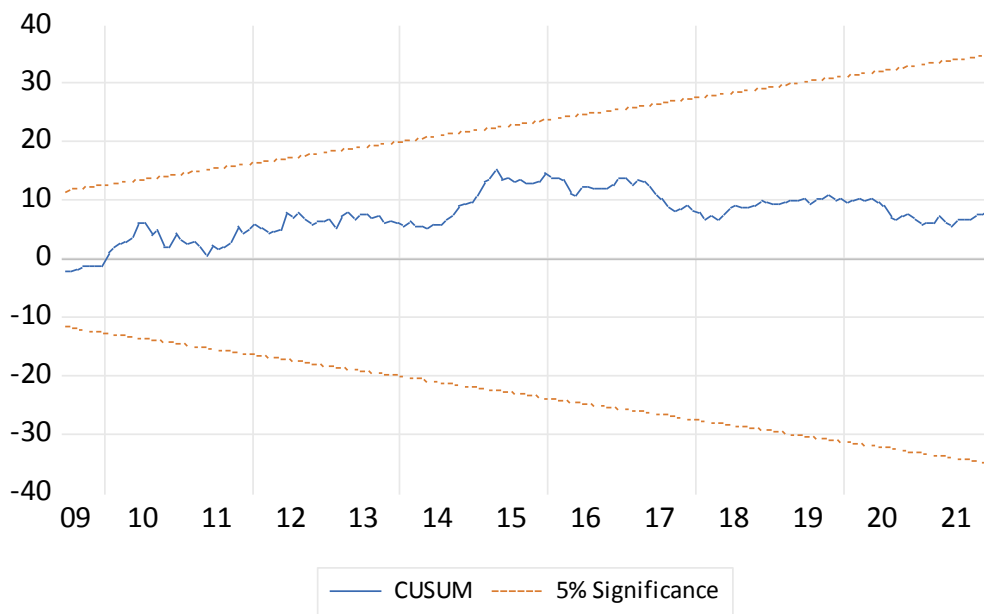
Source: Author's Construct (Fieldwork 2023)

**Figure A4.5 TGARCH News Impact Curve of ECOWAS**



Source: Author's Construct (Fieldwork 2023)

**Figure A4.6 CUSUM Plot of ECOWAS**



Source: Author's Construct (Fieldwork 2023)



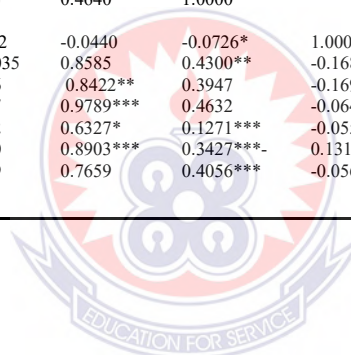
## APPENDIX B

Table B4.1 Correlation Matrix for West Africa

	Log-ER	Log-ED	Log-DS	Log-TT	FD	IQ	Log-GDP	IF	RQ	CC	GE	PS	RL	VA
Log-ER	1.0000													
Log-ED	0.0409	1.0000												
Log-DS	-0.0348	-0.9639***	1.0000											
Log-TT	0.1023***	0.2823***	-0.2704	1.0000										
FD	-0.0880	-0.0145	0.0072	-0.1397**	1.0000									
IQ	-0.1338**	0.3182***	-0.2600**	-0.0584*	0.0830	1.0000								
Log-GDP	-0.0920	0.0910**	-0.0361***	-0.1314*	0.1553**	0.4640***	1.0000							
IF	-0.0744	-0.1435***	0.1814***	-0.2029***	-0.0262	-0.0440	-0.0726*	1.0000						
RQ	-0.1475*	0.2851***	-0.2380	0.0087	0.1035	0.8585	0.4300**	-0.1685	1.0000					
CC	-0.1778	0.2862***	-0.2458***	-0.0927***	0.0966	0.8422**	0.3947	-0.1698**	0.8331***	1.0000				
GE	-0.2150***	0.3205*	-0.2688**	-0.0485	0.0897	0.9789***	0.4632	-0.0644	0.8537***	0.8305***	1.0000			
PS	-0.1449	0.1025***	-0.1527***	-0.1434***	0.0692	0.6327*	0.1271***	-0.0552	0.5695*	0.6666*	0.6010	1.0000		
RL	-0.1907***	0.2779	-0.2527	0.0219***	0.1000	0.8903***	0.3427***	0.1318	0.8672***	0.8853***	0.8666*	0.7337***	1.0000	
VA	-0.1604	0.1917*	-0.1790	-0.0361*	0.1269	0.7659	0.4056***	-0.0568*	0.6798***	0.7813***	0.7569**	0.6489**	0.8003***	1.0000

Source: Author's Construct (Fieldwork 2023)

Note: \*\*\*, \*\* and \* are significant level at 1%, 5% and 10% respectively.



**Table B4.2 Residuals Cross-Section Dependence Test**

Models	Breusch-Pagan LM	Pesaran scaled LM	Pesaran CD
(1)	665.51***	38.68***	2.27**
(2)	667.59***	38.82***	1.51
(3)	620.62***	35.58***	0.76
(4)	665.45***	38.67***	1.62*
(5)	647.91***	37.46***	1.97**
(6)	689.85***	40.36***	2.29**
(7)	659.9***	38.24***	1.80*
(8)	665.86***	38.70***	1.73*
(9)	609.34***	34.80***	1.32
(10)	657.82***	38.15***	1.77*

Source: Author's Construct (Fieldwork 2023)

Note: \*\*\*, \*\* and \* are significant level at 1%, 5% and 10% respectively.

**Table B4.3 PARDL Diagnostic Tests**

Table B4.3.1 Variance Inflation Factor

VIF Test	(1)		(2)		(3)		(4)		(5)		(6)	
Variable	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF
IQ												
RQ	1.02	0.9820										
CC			1.01	0.9949								
GE					1.04	0.9646						
PS							1.02	0.9846				
RL									1.01	0.9904		
VA											1.01	0.9872
Log-GDP	1.25	0.8021	1.25	0.7996	1.28	0.7838	1.25	0.7976	1.25	0.801	1.25	0.8003
Log-DS	1.08	0.9279	1.08	0.9294	1.08	0.9302	1.08	0.9297	1.08	0.9295	1.08	0.9243
FD	1.07	0.9379	1.06	0.9475	1.06	0.9420	1.06	0.9437	1.06	0.9476	1.06	0.9474
Log-ED	1.26	0.7955	1.26	0.7947	1.28	0.7802	1.26	0.7913	1.26	0.7952	1.26	0.7968
Log-TT	1.01	0.9925	1.01	0.9924	1.01	0.9927	1.01	0.9911	1.01	0.9908	1.01	0.9912
IQIQ												
IQFD												
IQTT												
Mean VIF	1.11		1.11		1.12		1.11		1.11		1.11	

VIF Test	(7)		(8)		(9)		(10)		
Variable	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF	
IQ	1.04	0.96075	1.18		0.85012	3.72	0.268558	2.09	0.4783
RQ									
CC									
GE									
PS									
RL									
VA									
Log-GDP	1.27	0.7872	1.28		0.7837	1.28	0.7819	1.27	0.7867
Log-DS	1.08	0.9301	1.08		0.9240	1.08	0.9280	1.08	0.9298
FD	1.06	0.9402	1.07		0.9367	1.19	0.8396	1.06	0.9398
Log-ED	1.29	0.7749	1.3		0.7684	1.29	0.7743	1.29	0.7744
Log-TT	1.01	0.9920	1.02		0.9797	1.01	0.9920	1.17	0.8511
IQIQ			1.17		0.8533				
IQFD						3.91	0.2560		
IQTT								2.24	0.4473
Mean VIF	1.12		1.16			1.93		1.46	

**Table B4.3.2 Breusch-Pagan / Cook-Weisberg test for heteroskedasticity**

Test Statistic	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Heteroskedasticity	0.16 (0.6923)	0.27(0.6017)	0.31(0.5803)	0.00(0.9476)	1.01(0.3155)	0.23(0.6293)	0.73(0.3940)
	(8)	(9)	(10)				
Heteroskedasticity	0.96(0.3287)	0.56(0.4537)	0.63(0.4296)				

**Table B4.3.3 Ramsey RESET Test on Functional Form**

Test Statistic	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Functional form	0.45(0.7148)	0.51(0.6759)	0.48(0.6956)	0.52(0.6673)	0.52(0.6677)	0.98(0.4015)	0.97(0.4076)
	(8)	(9)	(10)				
Functional form	2.02(0.1113)	0.71(0.5467)	0.73(0.5363)				

Source: Author's Construct (Fieldwork 2023)  
Probability values are in the parentheses.

**Table B4.4 Principal components (eigenvectors)**

Variable	Comp1	Comp2	Comp3	Comp4	Comp5	Comp6	Unexplained
CC	0.424	-0.1507	-0.0134	-0.8689	0.0258	0.2042	0
VA	0.3931	0.241	-0.8425	0.1895	0.1839	0.0892	0
RL	0.4379	-0.0487	0.1144	0.0138	0.0684	-0.8877	0
RQ	0.4088	-0.4408	0.3024	0.3618	0.5637	0.3139	0
PS	0.3549	0.8057	0.4301	0.0706	-0.0075	0.1868	0
GE	0.4252	-0.2711	0.0247	0.2704	-0.8019	0.1703	0

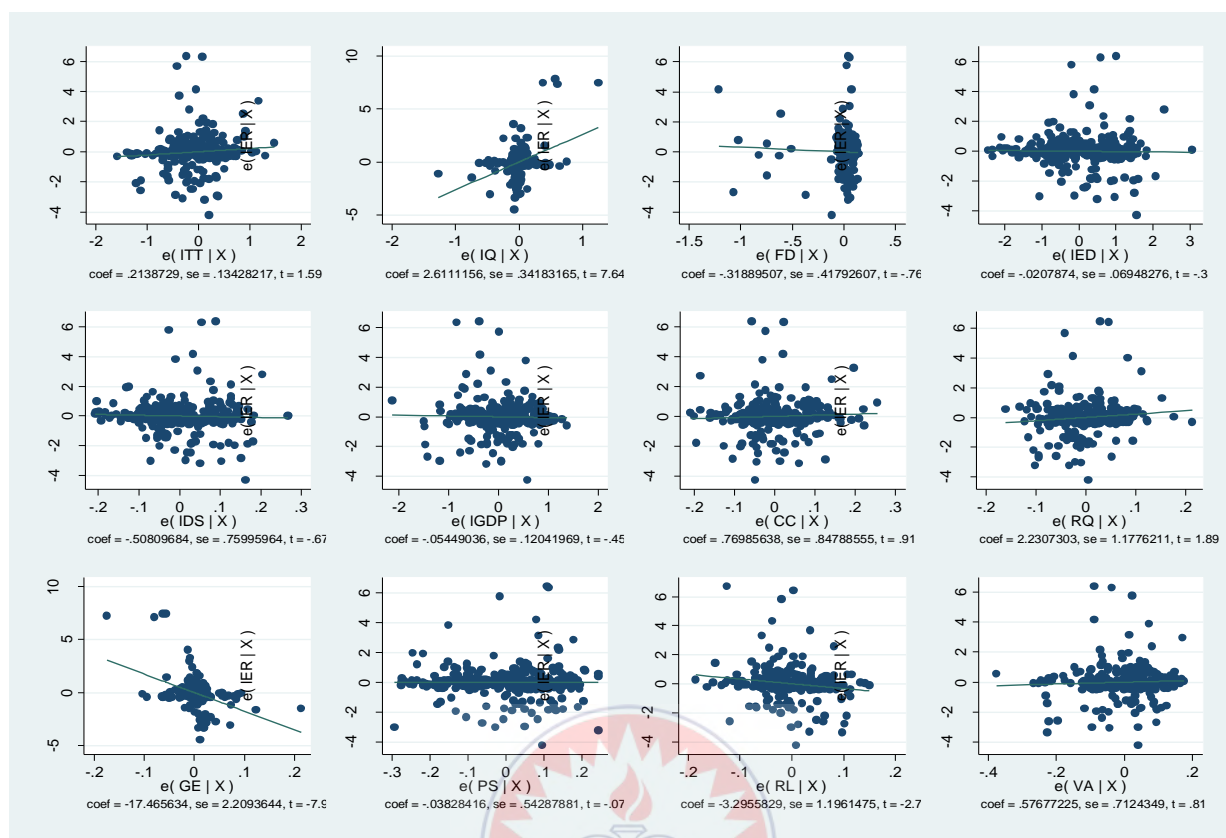
Source: Author's Construct (Fieldwork 2023)

**Table B4.5 Kaiser-Meyer-Olkin measure of sampling adequacy**

Variable	kmo
CC	0.9408
VA	0.9355
RL	0.8734
RQ	0.8853
PS	0.9051
GE	0.913
Overall	0.9074

Source: Author's Construct (Fieldwork 2023)

**Figure B4.1 The Relationship Between Exchange Rates and the Other Variables**



Source: Author's Construct (Fieldwork 2023)

- ER- Exchange Rate Returns
- TT – Terms of Trade
- RQ- Regulatory Quality
- PS- Political Stability
- IQ- Institutional Quality Index
- ED – External Debts
- CC- Control of Corruption
- RL – Rule of Law
- FD – Financial Development
- DS -Debts Services
- GE- Government Effectiveness
- VA – Voice and Accountability

**Table B4.6 Koa Cointegration Test**

Test statistics	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
ADF statistic	-4.2243	-4.2831	-4.3432	-4.2473	-4.2435	-4.2064	-4.2447	-4.1538	-5.3893	-4.4927
Residual variance	1.0782	1.0846	1.08	1.0679	1.0838	1.0851	1.0685	1.0677	1.0515	1.0656
HAC variance	0.9076	0.8875	0.8753	0.8416	0.8813	0.8555	0.8779	0.8505	0.8365	0.8925
P-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Source: Author's Construct (Fieldwork 2023)

**Table B4.7: Short-Run Results on the Terms of Trade, Institutional Quality and Exchange Rate in ECOWAS**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$\Delta$ FD	0.8338 (1.2223)	1.0623 (1.3053)	0.3235 (0.9617)	0.8858 (1.24)	1.2824 (1.2977)	0.3116 (1.2489)	0.4965 (1.2767)	1.0051 (1.5625)	15.4635 (12.8337)	-3.4255 (4.774)
$\Delta$ IQ							0.2109 (0.291)	2.6745 (3.1289)	-0.3377 (1.4827)	-0.7837 (4.3687)
$\Delta$ RQ	-0.6989 (1.8679)									
$\Delta$ CC		-2.0453 (2.5679)								
$\Delta$ GE			-0.5858 (0.2895)							
$\Delta$ PS				-4.1412** (2.0237)						
$\Delta$ RL					3.8898 (4.0076)					
$\Delta$ VA						-1.3654 (1.4941)				
$\Delta$ Log-GDP	-0.9697*** (0.3343)	-0.6231 (0.3929)	-0.4121 (0.2895)	0.6801 (0.4380)	-0.5318* (.2841)	-0.8684** (0.4406)	-0.7533* (0.4013)	0.178 (0.6475)	-0.6643* (0.3683)	-3.248 (3.4341)
$\Delta$ Log-TT	0.2321 (0.3896)	-0.0963 (0.4115)	0.1284 (0.3167)	-0.0013 (0.349)	0.0515 (0.4355)	0.4724 (0.3801)	0.2691 (0.2777)	-0.128 (0.4592)	0.1198 (0.3310)	3.837 (3.801)
$\Delta$ Log-ED	0.1207 (0.1201)	0.5152 (0.3298)	0.2501 (0.1589)	0.1117 (0.2927)	0.3257 (0.2414)	0.2567 (0.1732)	0.1046 (0.1042)	0.6764* (0.3928)	0.3182 (0.236)	0.5448* (0.3013)
$\Delta$ Log-DS	3.0421 (5.4006)	4.9134 (5.4806)	7.298 (4.817)	5.0551 (4.1283)	4.4446 (4.6622)	1.95 (6.7575)	7.3908 (5.0054)	6.5533 (4.1592)	4.7432 (5.0745)	15.2256 (11.3543)
$\Delta$ IQ*IQ								2.1205 (1.5416)		
$\Delta$ IQ*FD									15.0705 (15.0991)	
$\Delta$ IQ*TT										-0.01898 (0.3233)
Cons	3.5926*** (0.8680)	-0.0412 (0.0872)	2.83* (1.6932)	-0.493* (0.3021)	-1.28** (0.5497)	5.4584*** (1.8478)	3.542* (0.2147)	1.7823 (1.2445)	0.6218* (0.3232)	6.5336 (11.6359)
ECM	-0.3181*** (0.7437)	-0.0183 (95.4806)	-0.1936* (00.1191)	-0.2344* (0.1384)	-0.2883** (0.1248)	-0.1974*** (0.069)	-0.1073*** (0.06)	-0.1713 (0.1522)	-0.2268 (0.1503)	-0.9858 (0.8569)
Obs	276	276	276	276	276	276	276	276	276	276
Countries	15	15	15	15	15	15	15	15	15	15
Min Obs	15	15	15	15	15	15	15	15	15	15
Avg Obs	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4
Max Obs	19	19	19	19	19	19	19	19	19	19
Years	21	21	21	21	21	21	21	21	21	21

Source: Author's Construct (Fieldwork 2023)

Note: \*\*\*, \*\* and \* are significant level at 1%, 5% and 10% respectively.

Values in () are robust standard errors.



**Table B4.8: Short-Run Results of the Terms of Trade, Institutional Quality and Exchange Rate in Oil-Producing Francophone Countries in ECOWAS**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$\Delta$ FD	3.8658*** (1.548)	5.6587*** (.2768)	5.5274*** (5.5275)	5.3259*** (1.6866)	5.4987 (1.508)	6.7719 (1.296)	5.5275*** (1.6215)	6.8303*** (2.1697)	-1.4273 (7.7376)	5.8070*** (1.4833)
$\Delta$ IQ							-0.4824 (.7318)	-1.1447 (1.2895)	-2.67534 (2.469)	21.0121* (12.2873)
$\Delta$ RQ	-9.8973 (7.649)									
$\Delta$ CC		3.3174 (4.3328)								
$\Delta$ GE			-3.0592 (4.6408)							
$\Delta$ PS				0.8817 (6.9124)						
$\Delta$ RL					7.0514 (6.856)					
$\Delta$ VA						13.8614 (6.605)				
$\Delta$ Log-GDP	4.4509 (3.78)	4.4155 (3.079)	5.4257 (3.842)	6.5916* (3.671)	3.2109 (4.174)	1.927 (3.783)	5.4256 (3.8223)	5.6655 (4.8793)	14.0793*** (3.4531)	-5.0582 (6.2755)
$\Delta$ Log-TT	0.0297 (1.487)	-1.6647 (1.8976)	-0.0516 (1.836)	-1.2301 (2.1451)	-1.7967 (2.033)	0.9505 (1.309)	-0.5161 (1.8357)	-1.5439 (2.4813)	-2.8463*** (1.3602)	-15.8818* (8.982)
$\Delta$ Log-ED	0.05635 (0.9142)	1.0285 (1.0542)	1.2185 (1.245)	1.3625 (1.1799)	1.2379 (1.357)	0.8855 (0.931)	1.2184 (1.2448)	1.1153 (1.4843)	4.3041*** (1.1624)	-1.2906 (1.666)
$\Delta$ Log-DS	-7.3863 (11.9542)	3.4322 (11.8913)	3.1352 (12.7858)	9.613 (17.506)	1.899 (15.059)	-2.8178 (10.114)	3.1352 (12.7858)	12.1029 (16.006)	15.6046** (7.2437)	5.8667 (18.3442)
$\Delta$ IQ*IQ								-1.3341 (1.3745)		
$\Delta$ IQ*FD									15.595 (14.333)	
$\Delta$ IQ*TT										-0.2420* (.1339)
Cons	3.8219 (24.154)	-23.8533 (23.798)	-14.46411 (26.929)	-16.7104 (30.109)	-23.391 (27.295)	-28.919 (21.758)	-13.8713 (26.9166)	-36.1111 (33.8028)	21.0175 (14.3556)	-11.4003 (24.4377)
ECM	-0.0282 (0.422)	-0.0254 (1.2768)	0.174 (0.5118)	-0.2559 (0.5583)	-0.3048 (0.7272)	-0.5942 (0.6299)	0.174 (0.5118)	0.1732 (0.5524)	1.2128** (0.508)	-0.2473 (0.5286)

Source: Author's Construct (Fieldwork 2023)

Note: \*\*\*, \*\* and \* are significant level at 1%, 5% and 10% respectively.

Values in () are robust standard errors.

**Table B4.9: Short-Run Results of the Terms of Trade, Institutional Quality and Exchange Rate in Non-oil Producing Francophone Countries**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$\Delta$ FD	0.9971 (1.3439)	1.0938 (1.2624)	0.9443 (1.3938)	0.78466 (1.2975)	0.7333 (1.4057)	0.8074 (1.5264)	1.0478 (1.4315)	1.0863 (1.3136)	4.996 (6.7078)	1.7245 (1.264)
$\Delta$ IQ							0.625 (0.5335)	1.7654 (1.2760)	-0.1018 (0.4879)	0.8338 (2.1049)
$\Delta$ RQ	-2.569 (2.5165)									
$\Delta$ CC		-4.82 (5.2904)								
$\Delta$ GE			1.3264 (1.0594)							
$\Delta$ PS				-1.8603 (1.4761)						
$\Delta$ RL					7.6104 (9.0478)					
$\Delta$ VA						-3.2655* (1.9469)				
$\Delta$ Log-GDP	1.573** (0.6452)	-1.2324** (0.5706)	-1.3659*** (0.4852)	-1.4451** (0.709)	-1.428*** (0.5683)	-1.6618** (0.6867)	-1.4902*** (0.5821)	-1.0456*** (0.3606)	-1.645*** (0.4428)	-1.2248*** (0.4065)
$\Delta$ Log-TT	-0.0813 (0.4396)	-0.4424 (0.6173)	0.0056 (0.3924)	-0.059 (0.3265)	0.4026 (0.5854)	0.4916 (0.5194)	0.3468** (0.1579)	-0.2547 (0.8412)	0.1645 (0.1853)	-0.0463 (1.1896)
$\Delta$ Log-ED	0.2799 (0.2563)	0.4936 (0.5119)	0.1937 (0.1955)	0.3855 (0.2668)	0.2399 (0.1794)	0.202 (0.1667)	0.0656 (0.0892)	0.3519 (0.425)	0.0605 (0.086)	-0.1254 (0.1229)
$\Delta$ Log-DS	-0.9032 (6.4173)	-2.1021 (7.1136)	-0.8497 (5.5739)	-2.1434 (1.9425)	-6.5893 (13.0394)	-3.1626 (11.1002)	-2.8975 (4.4531)	-7.8433 (12.214)	-3.5553 (5.7123)	-4.3065 (7.0003)
$\Delta$ IQ*IQ								1.0412 (1.3386)		
$\Delta$ IQ*FD									13.5361 (11.7126)	
$\Delta$ IQ*TT										-0.0121 (0.0208)
Cons	3.9704** (1.7094)	0.0194 (0.1657)	3.8053** (1.6513)	4.329** (1.9425)	4.0733 (1.9324)	4.5557*** (1.7364)	3.4302** (1.5988)	2.3965 (2.1115)	3.6565** (1.56601)	1.2825
ECM	-0.2638*** (0.098)	0.4145 (0.7245)	-0.2466*** (0.0796)	-0.235*** (0.0868)	-0.2157*** (0.2157)	-0.2453*** (0.0739)	-0.2287*** (0.0757)	-0.1744 (0.1918)	-0.2521*** (0.0886)	-0.2433** (0.111)
Obs	131	131	131	131	131	131	131	131	131	131
Countries	7	7	7	7	7	7	7	7	7	7
Min Obs	17	17	17	17	17	17	17	17	17	17
Avg Obs	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7
Max Obs	19	19	19	19	19	19	19	19	19	19
Years	21	21	21	21	21	21	21	21	21	21

Source: Author's Construct (Fieldwork 2023)

Note: \*\*\*, \*\* and \* are significant level at 1%, 5% and 10% respectively.

Values in () are robust standard errors.

**Table B4.10: Long-Run Results of the Terms of Trade, Institutional Quality and Exchange Rate in Oil-producing Non-Francophone Countries in ECOWAS**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
FD	-3.9038** (2.0178)	8.0296 (11.8104)	-7.0554 (5.5422)	-15.0645 (9.5788)	-4.0021 (16.33)	12.6208 (12.137)	-7.0555 (5.5422)	-5.2679 (6.4105)	44.943 (1236.51)	-0.0025 (1.1397)
IQ							-0.8441 (0.6016)	-1.2861 (0.8118)	-493.8375 (12138.22)	1.1284*** (0.0837)
RQ	-1.0576 (1.5187)									
CC		-30.9363 (21.7582)								
GE			-5.3528 (3.815)							
PS				4.1928 (8.1154)						
RL					-2.2032 (11.2268)					
VA						25.3601* (13.9299)				
Log-GDP	-2.0983*** (0.4026)	-3.0378 (2.4503)	-0.2755 (0.6896)	-1.2576 (1.1579)	-0.9344 (1.6702)	-1.0983 (1.4112)	-0.2755 (0.6896)	-0.9632 (1.5444)	-393.5946 (9701.44)	1.9079*** (0.1049)
Log-TT	0.64789*** (0.1749)	-0.6292 (0.9462)	-0.8942 (0.6189)	-1.4986 (0.948)	-2.1364 (1.8548)	-4.3997* (2.3357)	-0.8942 (0.6189)	-1.2087 (0.903)	69.5332 (1707.52)	-2.0198*** (0.1358)
Log-ED	-1.1597*** (0.1537)	-1.0812 (0.9562)	0.3634 (0.4063)	-0.0282 (0.5483)	1.3643 (1.5009)	1.1461 (0.9654)	0.3634 (0.4063)	0.4038 (0.6955)	-125.6015 (3088.08)	2.5504*** (0.1429)
Log-DS	-0.8767 (1.414)	-7.1162 (8.6658)	-9.46** (4.5144)	-5.8225 (5.8964)	-15.0466 (13.9377)	-21.0236* (12.3916)	-9.4598** (4.5144)	-11.076 (7.195)	-669.6671 (16414.33)	-25.218*** (1.3246)
IQ*IQ								-0.2583 (0.5648)		
IQ*FD									1816.763 (44642.95)	
IQ*TT										0.0104*** (0.0013)
Cons	10.8833*** (3.5713)	16.588*** (5.4774)	16.0378*** (3.1184)	12.63332*** (0.1404)	15.3249*** (2.5741)	23.2717*** (6.3423)	15.2836*** (2.9646)	18.2476*** (4.5003)	29.1647*** (2.9106)	16.811*** (4.3819)
ECM	-0.581*** (0.1964)	-0.3127*** (0.0710)	-0.5691*** (0.116)	-0.4268*** (0.0371)	-0.3326*** (0.0688)	-0.4307*** (0.43068)	-0.5691*** (0.1160)	-0.4942*** (0.1202)	-0.0064*** (0.0004)	-0.4194*** (0.1499)
Obs	38	38	38	38	38	38	38	38	38	38
Countries	2	2	2	2	2	2	2	2	2	2
Min Obs	19	19	19	19	19	19	19	19	19	19
Avg Obs	19	19	19	19	19	19	19	19	19	19
Max Obs	19	19	19	19	19	19	19	19	19	19
Years	21	21	21	21	21	21	21	21	21	21

Source: Author's Construct (Fieldwork 2023)

Note: \*\*\*, \*\* and \* are significant level at 1%, 5% and 10% respectively.

Values in () are robust standard error

**Table B4.11: Short-Run Results of the Terms of Trade, Institutional Quality and Exchange Rate in Non-Oil Producing Non-Francophone Countries in ECOWAS**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$\Delta$ FD	-6.379 (5.137)	-4.0092 (3.3085)	-4.2613 (3.514)	-4.402 (3.658)	-6.7413 (7.2648)	3.5161 (6.7194)	-1.9425 (2.0351)	-7.62 (6.3159)	28.3326 (26.548)	-11.2663 (12.88)
$\Delta$ IQ							0.3593 (0.3503)	13.2315 (7.487)	-0.6728 (3.1201)	-5.7108 (6.496)
$\Delta$ RQ	0.1751 (7.4715)									
$\Delta$ CC		-0.0628 (4.123)								
$\Delta$ GE			-1.0272 (6.076)							
$\Delta$ PS				-5.0029 (4.69)						
$\Delta$ RL					5.2065 (7.999)					
$\Delta$ VA						-10.6222*** (4.0488)				
$\Delta$ Log-GDP	-1.4428* (0.7938)	-2.8887 (2.339)	-1.9924 (1.31)	-1.615* (0.883)	2.1497 (2.605)	-0.1702 (1.1208)	-0.33804* (0.1961)	-1.546 (0.5358)	-1.3085 (0.8287)	-9.4481 (10.2095)
$\Delta$ Log-TT	1.2129*** (0.4423)	1.4761*** (0.4566)	0.8047 (0.5076)	-0.7902 (0.8153)	1.4324*** (0.5535)	-0.4132 (1.2)	0.9312* (0.5438)	0.9472 (0.6251)	0.8448 (0.7657)	2.0416 (3.3802)
$\Delta$ Log-ED	-0.4283 (0.5395)	-0.2716 (0.3944)	0.3304 (0.2628)	-0.669 (0.8545)	0.6507 (1.0315)	0.4466 (0.3231)	-0.0573 (0.2502)	-0.6735*** (0.2717)	-0.3702 (0.378)	0.2107 (0.4592)
$\Delta$ Log-DS	1.478 (7.2986)	5.707 (14.9158)	8.1396 (9.8673)	10.8872 (19.92588)	8.5039 (12.0605)	6.0401 (6.6613)	8.4738 (12.7892)	8.0595 (12.8443)	13.2735 (14.1947)	19.1416 (13.857)
$\Delta$ IQ*IQ								5.2794 (3.819)		
$\Delta$ IQ*FD									37.8723 (33.3744)	
$\Delta$ IQ*TT										0.0198 (0.0584)
Cons	-10.245 (36.908)	38.5642*** (14.239)	18.7128 (9.503)	-18.01 (30.0122)	-12.7231 (41.523)	34.8857 (21.259)	8.7437 (12.7892)	3.3224 (3.7282)	3.7351 (0.4.2979)	34.0251 (21.206)
ECM	-0.7771 (0.5766)	-1.0296 (0.7528)	-0.1149 (0.4212)	0.5353** (0.257)	-0.0322 (0.3304)	-0.4831 (0.4708)	0.1301 (0.1865)	0.2169 (0.2551)	0.2561 (0.3266)	-2.1527 (2.57)
Obs	88	88	88	88	88	88	88	88	88	88
Countries	5	5	5	5	5	5	5	5	5	5
Min Obs	15	15	15	15	15	15	15	15	15	15
Avg Obs	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6
Max Obs	19	19	19	19	19	19	19	19	19	19
Years	21	21	21	21	21	21	21	21	21	21

Source: Author's Construct (Fieldwork 2023)

Note: \*\*\*, \*\* and \* are significant level at 1%, 5% and 10% respectively.

Values in () are robust standard errors

