ANALYSIS OF THE COSTS AND BENEFITS OF A COMMON CURRENCY FOR THE SECOND WEST AFRICAN MONETARY ZONE

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Abstract

The second West African Monetary Zone (WAMZ), comprising The Gambia, Ghana, Guinea, Nigeria and Sierra Leone, was initiated in 1999 to fast-track the common monetary policy objective of the Economic Community of West African States (ECOWAS). However, uncertainties about the economic implications of the policy have been major obstacles to regional integration. Economists and policymakers are yet to agree on the potential costs and benefits of a common currency. Available empirical studies on WAMZ focused separately on the elements of costs and benefits of monetary union, which makes them limited in scope. This study, therefore, offered an integrated analysis of the costs and benefits of a common currency in WAMZ spanning 1980 to 2009.

A two-step methodological procedure, based on the Optimum Currency Area (OCA) and the New Optimum Currency Area (NOCA) frameworks, were used to estimate the costs and benefits of monetary union in WAMZ. First, behavioural models, capturing the elements of costs (asymmetric shocks, loss of seigniorage and fiscal policy distortion) and benefits (trade creation, financial integration effects and policy coordination gains), were estimated with the Vector Auto-regression (VAR), Error Correction Model (ECM) for each of the sampled countries and panel estimation techniques for the group. Second, weighted composite indices were constructed for the costs and benefits indicators using the parameter estimates obtained from the various estimation techniques. The VAR impulse response and forecast error methods were employed to estimate countries' response to shocks. Robustness tests, including data calibration for the net-benefit using a money metric baseline and ranking, were carried out to permit comparison of results among countries.

Fiscal policy distortion and loss of seigniorage were the main cost indicators of monetary union in the zone rather than asymmetric shocks. The share of fiscal policy distortion stood at 72.4%, while loss of seigniorage contributed 18.4% to the costs of monetary union. Ghana recorded the highest costs of 36.0% for fiscal policy distortion and 65.0% for loss of seigniorage in the zone. The Gambia had the lowest seigniorage cost of 8.0%. Considerable variations existed among Sierra Leone, The Gambia and Nigeria as fiscal policy distortion accounted for 30.0%, 22.0% and 12.0%, respectively. Trade creation shared 89.0% of the total benefits for the zone. Policy coordination gains had the lowest share of 1.6% for the region. Trade creation gains ranged between 41.0% and 3.0% among the countries with Sierra Leone and Nigeria sharing the highest

and lowest gains, respectively. The net-benefit of monetary union for the zone was potentially high with substantial variations among members. Sierra Leone and Nigeria had the highest and lowest net-benefit respectively from the ranking scale.

Trade creation accounted for a substantial proportion of the potential benefits of common currency in WAMZ. However, fiscal policy distortion constitutes serious policy challenge to monetary union in the zone. Dealing with this challenge may require in the short-run, systematic macroeconomic adjustments to improve fiscal-monetary policy interactions in order to enhance the benefits of monetary union in the zone.

Key words: Optimum Currency Area, Behavioural models, Seigniorage, Fiscal policy distortion, Asymmetric shocks.

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May 2012

Certification

I certify that this research work was carried out by Harrison Oluchukwu OKAFOR, of the Department of Economics, Faculty of the Social Sciences, University of Ibadan, Ibadan, Nigeria under my supervision.

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Dedication

This work is dedicated to God the father, son and the Holy Spirit for his steadfast love and abundant grace that saw me through and to the blessed memories of my specially loved ones.

Table of Content

Title page	i
Abstract	ii
Acknowledgement	iv
Certification	vii
Dedication	viii
Table of content	ix
List of Tables	xiii
List of figures	xv

CHAPTER ONE: Introduction

1.1	Statement of the Problem	1
1.2	Objective of the Study	4
1.3	Justification of the Study	4
1.4	Scope of the Study	6
1.5	Organization of the Study	7

CHAPTER TWO: Background to the Study

2.1	Evolution of ECOWAS and WAMZ	8
2.2	An Overview of the WAMZ Economies	10
2.3	Macroeconomic Frameworks and Developments	19
2.3.1	The Gambia	19
2.3.2	Ghana	25
2.3.3	Guinea	30

2.3.4 Nigeria 33

2.3.5 Sierra Leone 38

2.4 Trend Analysis 44

CHAPTER THREE: Literature Review

3.1 Theoretical Issues and Review 51

3.1.1 Costs of Monetary Union 52

3.1.1.1 Optimum Currency Area Theory 52

3.1.1.2 New Optimum Currency Area Theory 56

3.1.1.3 Asymmetric Shock Effect 58

3.1.1.4 Loss of Independent Monetary Policy 62

3.1.1.5 Fiscal Policy Distortion 65

3.1.2 The Benefits of Monetary Union 67

3.1.2.1 Trade Creation Effect 68

3.1.2.2 Financial Integration Effect 70

3.1.2.3 Gains from Policy Coordination 72

3.2 Methodological Review 76

3.2.1 Costs of Monetary Union 77

3.2.1.1 Asymmetric Shock 77

3.2.1.2 Loss of Independent Monetary Policy 81

3.2.1.3 Fiscal Policy Distortion 82

3.2.2 The Benefits of Monetary Union 83

3.2.2.1 Trade Creation Effect 84

3.2.2.2 Financial and Capital Market Effect 84

3.2.2.3 Gains from Policy Coordination 86

3.2.3 Key Variables/Data Review 87

3.2.4 Review of Estimation techniques 88

3.3 Empirical Review 90

CHAPTER FOUR: Theoretical framework and Methodology

4.1 Theoretical Framework 99

4.2 Methodology 111

4.2.1 Model Specification 111

4.2.2 Net-Benefit of Monetary Union 117

4.2.3 Computation of Composite Index of Net-Benefit 117

4.2.4 Description of Key Variables and Measurement 118

4.2.5 Data Sources 119

4.2.6 Estimation Techniques and Procedures 120

CHAPTER FIVE: Empirical Analysis

5.1 Data Diagnosis 121

5.1.1 Unit Root Tests 121

5.1.2 Cointegration Analyses 124

5.1.3 The Statistical Properties of the Variables 125

5.2 Estimates of Costs of Monetary Union 126

5.2.1 Asymmetric Shock 126

5.2.2 Loss of Seigmorage 129

5.2.3 Fiscal Policy Distortion 139

5.3 Estimates of Benefits of Monetary Union 151

5.3.1 Trade Creation Model 151

5.3.2 Financial and Capital Market Effects 161

5.3.3 Policy Coordination Gains 171

5.4 Estimates of Net-Benefits 181
5.5 Discussion/interpretation of Results 190
5.6 Robustness Checks 195

CHARTER SIX: Summary, Conclusion and Recommendation

6.1 Summary 171
6.2 Conclusion 199
6.3 Policy Recommendation 200
6.4 Limitation and Agenda for future Research 201

References 202
Appendixes

List of Tables

Table 2.1	Basic Indicators for Countries in the WAMZ	11
Table 2.2	Selected Macroeconomic Indicators of the WAMZ Countries	43
Table 5.1	Unit Root Test Result	122
Table 5.2	Asymmetric Shock Result	126
Table 5.3	Loss of Seigniorage Result for WAMZ	129
Table 5.4	Loss of Seigniorage Result for The Gambia	131
Table 5.5	Loss of Seigniorage Result for Ghana	133
Table 5.6	Loss of Seigniorage Result for Nigeria	135
Table 5.7	Loss of Seigniorage Result Sierra Leone	137
Table 5.8	Fiscal Policy Distortion Result for WAMZ	139
Table 5.9	Fiscal Policy Distortion Result for The Gambia	141
Table 5.10	Fiscal Policy Distortion Result for Ghana	143
Table 5.11	Fiscal Policy Distortion Result for Nigeria	145
Table 5.12	Fiscal Policy Distortion Result for Sierra Leone	148
Table 5.13	Trade Creation Model Result for WAMZ	151
Table 5.14	Trade Creation Model Result for The Gambia	153
Table 5.15	Trade Creation Model Result for Ghana	155
Table 5.16	Trade Creation Model Result for Nigeria	157
Table 5.17	Trade Creation Model Result for Sierra Leone	159

Table 5.18 Capital Efficiency Model Result for WAMZ 161

Table 5.19 Capital Efficiency Model Result for The Gambia 163

Table 5.20 Capital Efficiency Model Result for Ghana 165

Table 5.21 Capital Efficiency Model Result for Nigeria 167

Table 5.22 Capital Efficiency Model Result for Sierra Leone 169

Table 5.23 Policy Coordination Gain Result for WAMZ 171

Table 5.24 Policy Coordination Gain Result for The Gambia 173

Table 5.25 Policy Coordination Gain Result for Ghana 175

Table 5.26 Policy Coordination Gain Result for Nigeria 177

Table 5.27 Policy Coordination Gain Result for Sierra Leone 179

Table 5.28 Composite Index Result for the Cost-Benefit Analysis 182

Table 5.29 Real Value of the Net-Benefit Analysis 188

List of Figures

Fig 2.1: Money Supply Growth in WAMZ 17

Fig 2.2: Share of Trade in ECOWAS 18

Fig 2.3: Fiscal Deficit as a Percentage of GDP in WAMZ 45

Fig 2.4 Broad Money Growth and Reserve Money in WAMZ 47

Fig 2.5 Interest Rate Spread in WAMZ 48

CHAPTER ONE

INTRODUCTION

So much barbarism, however, still remains in the transaction of most civilized nations, that almost all independent countries choose to assert their nationality by having, to their own inconvenience and that of their neighbors, a peculiar currency of their own

J.S Mill (1894)

This section, explores the statement of the problem, the objectives of the study, the scope and structure of the thesis as well as the justification for the study.

1.1 Statement of the Problem

Fiscal and monetary policies are two key traditional instruments used by policymakers to direct and manage economies. Over the last five decades, one of the key issues confronting economists and researchers is the interaction between fiscal and monetary policies. The interaction between fiscal and monetary policies as tools of economic management both at the country level and under a monetary union continues to attract research and policy attention for at least two reasons. First, the two policies and their instruments are critical in economic management of any nation or region. Second, the complementarities and conflicts of both policies have severe consequences for the stability of an economy as well as the ability to dampen business cycles (Sargent and Wallace, 1981; Dixit and Lambertini, 2001; Hannif and Arby, 2005 and Jensen and Lambertini, 2006).

Elements of mainstream economic literature relating to the interaction of fiscal and monetary policies cover such issues as the relationship between fiscal deficit financing and its consequences for monetary management, and the fiscal theory of price level which shows how the monetary authorities' accommodation of fiscal expansion may precipitate or strengthen inflationary trends (Hannif and Arby, 2005 and Oyejide, 2005). Perhaps, an intriguing economic feature peculiar to most African nations, particularly countries in the Economic Community of the West African States (ECOWAS) sub-region, is the challenge of sub-optimal interaction between fiscal and monetary policies with typifying budget deficits and its financing implications. A survey of evidence from recent studies[1] reveal that the African

[1] Iyoha, 2003, Debrun et al, (2005) and Hefeker (2008) contain excellent review of literature.

region has been characterized by a great deal of dismal economic performance as evident in their rising inflation rates, low economic growth, rising unemployment rates, weak export base and high dependence on imports from developed and emerging market economies (Iyoha, 2003).

In some countries of Sub-Sahara Africa (SSA), particularly the West African sub-region, budget deficit has grown from low single digit levels in the 1980s to unprecedented two digit levels in the 1990 and the 2000 decades (Debrun, *et al*. 2005; Udo, 2007 and Hefeker, 2008). Specifically, the relative weak nature of the countries' tax base and the associated inefficiencies in the administration of tax policies are among the classical culprits accounting for these macro-imbalances. Moreover, the level of inter and intra-regional trade in the ECOWAS region has continued to be very weak and hampered by a number of factors including poor regional transportation network, exchange rate fluctuations and the use of multiple currencies with multiple units of accounts (Asenso-Okyere, 2005 and Balogun, 2008).

Consequently, in attempt to tackle these poor economic conditions, African nations including those in the West African sub-region have initiated series of economic policy reforms and consolidated strategies. One of such policy strategies is the adoption of regional economic and monetary integration schemes across the region. Economic and monetary integration in the West African sub-region has long remained an integral policy objective of the (ECOWAS)[2]. Nevertheless, lack of commitment, non-uniform adoption of required macroeconomic framework and lack of policy coordination and harmonization between the CFA Franc zone and the non-CFA franc zone countries have been major obstacles to the effective implementation of regional integration in the region. Interests of recent studies have linked these constraints to poor institutional factors and poor economic performance of member states (Balogun, 2008 and ECOWAS, 2008). However, since the successful launch of the European Economic and Monetary Union (EMU) in 1999, a great deal of interest has been renewed on monetary union in ECOWAS and other regions across the world (Masson and Pattillo, 2004). A major leap to this is the effort to create a second monetary zone in ECOWAS as contained in the revised ECOWAS treaty and protocols (ECOWAS, 2000).

The second West African Monetary Zone (WAMZ), comprising The Gambia, Ghana, Guinea, Nigeria and Sierra Leone was initiated in 1999 to fast-track the common monetary

[2] ECOWAS was established in May, 1975 and encompasses an existing monetary union of the UEMOA zone.

policy framework of ECOWAS. Nonetheless, uncertainties about the economic implications of the policy have been major obstacles to the project. Although there is a growing and interesting literature on monetary union across the globe, the theoretical and empirical evidences on the potential costs and benefits of a common currency have been mixed and inconclusive among economists and policymakers. For instance, Collier (1991), Soyibo (1998), Masson and Pattillo (2001), Obaseki (2003) and Ogunkola (2001, 2005) suggest that monetary union may be beneficial under certain circumstances like meeting up with the convergence criteria. On the other hand, Masson and Pattillo (2002) and Debrun, Masson and Pattillo known as (DMP) (2005, 2010) report that monetary union in ECOWAS/WAMZ involving Nigeria could be very costly. This prediction is based on the nature of interaction between fiscal and monetary policies in the zone. A major challenge for economists has been the development of analytical tools to test or adumbrate the potential economic costs and benefits of monetary unification.

Currently, the decision to form a second monetary union in the ECOWAS/WAMZ sub-region has further gathered momentum but the feasibility and sustainability remain bleak in the minds of policymakers and economists. The level of commitment and efforts of some member nations towards establishing economic and monetary union in the second monetary zone has been weak and in large part, due to low political support accorded to it by member countries of the region (Baldwin, 1998 and ECOWAS, 2005). Apparently, the low political weight attached to economic and monetary integration in most countries of ECOWAS particularly in the second West African Monetary Zone is not ambiguous. Policymakers in the zone are not certain about the cost implications such as the loss of the member's independent monetary autonomies as well as the potential benefits like trade creation and enhanced policy credibility of joining a monetary union as experienced in other monetary zones.

A persuasive argument is that issues relating to the costs and benefits of monetary union in ECOWAS generally and the WAMZ sub-region in particular, have not been confronted with sound empirical research attention that could distill the doubts of policymakers for better and informed decision on the project. In this attempt, this study seeks to offer empirical account to the following research questions; (i) Are there costs of forming monetary union in WAMZ? (ii) Are there expected benefits of forming a monetary union in WAMZ? (iii) If yes, do these costs and benefits vary among WAMZ members?

1.2 Objectives of the Study

The broad objective of this study is to analyse the potential costs and benefits of a common currency for the second West African Monetary Zone (WAMZ). The specific objectives are to:

(1) Estimate the costs of a common monetary policy/ currency and a single central bank in the sub-region.

(2) Estimate the benefits of adopting a common monetary policy and a single central bank in the sub-region.

(3) Compare the costs and benefits of monetary union among the integrating countries.

1.3 Justification for the Study

The justification for this study is threefold namely; theoretical, methodological and empirical. From the theoretical perspective, several studies have emerged in their attempts to espouse the costs and benefits of monetary unions since the pioneering works of Mundel (1961), McKinnon (1963), Kenen (1969) and Ingram (1972) on optimum currency area theory. However, most of these studies focused exclusively on the costs of adopting a monetary union with emphasis on the nature of shocks symmetries in a region as the theoretical basis for assessing the net-benefits of such union. Nevertheless, the new optimum currency area theory, though anchored on the benefits of monetary union did not cover the costs of relinquishing monetary policy autonomy (Frankel and Rose, 1998 and Beetsma and Bovenberg, 1998). These two baseline theories do not separately demonstrate a sufficient theoretical framework for the analysis of the costs and benefits of monetary unification. The emphasis on the costs side of the optimum currency area could not underpin some direct benefits (Ricci, 2008). Similarly, the benefits of monetary union have been discussed by the new optimum currency area in various perspectives without recourse to the direct consequences of losing independent monetary policy autonomy which makes it difficult for welfare analysis (Mongelli, 2002). This study, therefore, overcome these shortcomings by developing a hybrid of both theoretical considerations to analyse the costs and benefits of monetary union in WAMZ.

Another major contribution of this study is in the methodological approach. Several studies developed different models for analysing the costs and benefits of

monetary union in the literature (Bayoumi and Eichengreen, 1992; Eichengreen, 1993, 1996 and Bini-Smaghi and Vori, 1994 for the European Monetary Union (EMU); Bergmann, 1999 for the Scandinavian Currency Union (SCU); Ferrari-Filho, 2001 for MERCOSUR countries; and Ogunkola, 2001, 2005 and Ogunkola and Jerome, 2005 for the West African Monetary Zone). Most of these studies focused on the measurement of shocks (Bayoumi and Eichengreen 1992, Masson and Pattillo, 2001 and Ogunkola, 2005). Although these studies intended to explore the costs of forming a monetary union in these zones, the approaches seem to be the determination of the optimum currency area criteria. Other studies have examined the trade creation and financial integration effects of monetary union (Frankel and Rose, 1998; Lane 2000; Rose, 2000; and Nnanna, *et al*. 2007). In particular, Debrun, Masson and Pattillo (2005 and 2010) explored the effect of fiscal policy distortion in the West African Monetary Zone. It may be instructive to emphasize that the models adopted by these authors appear to focus on specific elements regarding the costs and benefits of monetary union.

The method of this research study is different from earlier studies in three ways. First, the key elements of costs and benefits were identified in a more comprehensive and integrated manner. Second, these elements were estimated using the vector auto-regressive procedures, error correction mechanism and panel estimation technique after adjusting some of these models to account for the character of the economies. Third, detailed comparison of the costs and benefits analysis for the integrating countries was carried out through a cost-benefit technique. This is permitted since our choice variables were divided by their gross domestic products (GDPs) to reflect the sizes of the economies. Again, to account for recent developments on the subject, the scope of the study is extended beyond the scope covered by earlier studies. Furthermore, historical data of the countries are utilized to evaluate their autonomous policies performance as a benchmark for assessing the incentives and potential costs and benefits in a monetary union[3].

On the empirical aspect, despite the relatively growing body of empirical works on the costs and benefits of joining a monetary union, few available studies exist in the case of WAMZ and are very limited in scope. Most studies focused separately on the specific elements of costs

[3] Schubert and Wehinger (1998) used historical data to evaluate the autonomous monetary policy performance of European countries as a basis for determining the costs and benefits of the European monetary union.

with little empirical attention on the benefits of monetary union in WAMZ. This study covered both elements using an integrated approach involving the countries' and group analyses. However, within the domain of costs and benefits of monetary unification, some measure of consensus and a wide range of divergent views exist in the literature across regions and individual countries. For instance, in the case of ECOWAS/WAMZ, while studies like Collier (1991), Soyibo (1998), Masson and Pattillo (2001 and 2002), Obaseki (2003) and Ogunkola (2005) suggest that monetary union may be beneficial under certain circumstances like meeting up with the convergence criteria, others reported that the costs of losing monetary sovereignty may be higher than the benefits (Debrun, Masson and Pattillo, 2005 for WAMZ, Bayoumi and Eichengreen, 1992 for EMU, and Bergmann1999 for SCU). This study revealed that monetary union in the second West African monetary zone has potential net-benefit for the group. Interestingly, evidence of some high and marginal net-gainers was equally found which could provoke the need for compensatory mechanism for the project.

1.4 Scope of Study

The study focused generally on monetary integration scheme in the Economic Community of the West African State (ECOWAS) and particularly on the analysis of the potential costs and benefits of a common currency in the second West African Monetary Zone (WAMZ). The study covered the five integrating countries of the zone: The Gambia, Ghana, Guinea, Nigeria and Sierra Leone. Although WAMZ was initiated in 1999, the study period covered 1980 and 2009. The choice of this period is influenced by the need to cover the pre-integration and post-integration period as well as the availability of data. Some of the key variables used for the study include central bank money reserve, government revenue, credit to the government, credit to the private sector, interest rate spread, inflation, exchange rate, government expenditure, public debt, fiscal deficit, trade flow and terms of trade.

1.5 Organization of the Study

This study is structured into six chapters. Following this introduction, the rest of the study is structured as follow. In chapter two, the background issues covering the evolution of the economic and monetary integration process of the ECOWAS and WAMZ, the overview of the economies of the West African monetary zone and the trend analysis of selected macroeconomic variables are articulated. Following the background, a detailed discussion of the theoretical, methodological and empirical literature reviews are contained in chapter three. Chapter four focused on the theoretical framework and methodology for the study. The presentation and discussion of results are presented in chapter five, and chapter six concludes the study with summary and policy implications of the study.

CHAPTER TWO

ECONOMIC AND MONETARY INTEGRATION IN ECOWAS/WAMZ

.....Therefore, it is utopian to separate the problem of monetary union from political unification... Monetary union is an essential part of political union.

De Grauwe (1984)

The section presents in a stylised manner, the evolution of the economic and monetary integration process of the Economic Community of the West African States (ECOWAS) and the second West African Monetary Zone (WAMZ). The overview of the economies in the West African monetary zone and the trend analysis of selected macroeconomic variables are also discussed in this chapter.

2.1 Evolution of ECOWAS and WAMZ

The Economic Community of the West African States (ECOWAS) was established in 1975 with the primary objective of forging strong economic and monetary integration in the sub-region. The community comprises of fifteen nations, namely Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Nigeria, Niger, Senegal, Sierra Leone and Togo, while Mauritania exited the union in 2000. The ECOWAS project was aimed at widening regional markets and opportunities in trade, and to promote financial and monetary stability in the region. Through the establishment of a common market and a single currency, the ECOWAS integration[4] arrangement was expected to accelerate economic growth and transformation of the sub-region with the overall aim of alleviating poverty among the people. ECOWAS is divided into two main blocks: the West Africa Economic and Monetary Union (WAEMU) zone that shares a common currency with the Central Africa Economic and Monetary Union (CAEMU); the CFA zone and the non-WAEMU countries that use their separate national currencies.

[4] Integration of economies cover economic integration/Preferential Trade Agreements (PTAs) for instance, ACP-EEC Lome convention, Free Trade Area (NAFTA, LAFTA), Custom Union (CET), Common Market (EEC) and Monetary Union which is the last stage.

The community has traversed through process of realizing its policy objectives. Among these include the design and implementation of the ECOWAS Common External Tariff (CET), ECOWAS Trade Liberalization Programme (ETL), and the various aspects of the Economic Partnership Agreements (EPAs) of the African Caribbean and Pacific nations (ACP) and the European Union (EU) within the World Trade Organization (WTO) revised treaties and trade rules.

A critical element of the integration programme as contained in its protocol was the adoption of the ECOWAS Monetary Co-operation Programme (EMCP) in 1987. The EMCP was developed to facilitate the achievement of a single monetary zone with a common currency and a common central bank. Subsequently, the West African Monetary Agency (WAMA) based in Sierra Leone was set up in 1996 to harmonize the payment system of the zone as well as internalize the ECOWAS bank cheques to facilitate inter and intra-regional trade in the ECOWAS sub-region. WAMA was renamed after the West African Clearing House (WACH) following the revised treaty contained in the new ECOWAS protocol. The inability to achieve these aforementioned objectives more than a decade after the target was set gave rise to the creation of a "fast track" measure as short cut to realize monetary integration in ECOWAS.

The authorities of ECOWAS Heads of States and Governments at a meeting on the 9-10th of December, 1999 in Lome, Togo, gave impetus to two or more countries to implement alternative fast lane of achieving any aspect of the ECOWAS integration programmes. Thus, at a meeting in Accra, Ghana on April 20, 2000, six West African countries declared their intentions to proceed to a monetary union among the non-CFA countries of the region by 2003 as a first step towards realizing the wider monetary union including all the ECOWAS countries in 2004. Therefore, the second monetary zone emerged as a fast track initiative designated as the West African Monetary Zone (WAMZ) which comprises four English speaking countries; The Gambia, Ghana, Nigeria, and Sierra Leone and a French speaking country; Guinea while Liberia and Cape Verde participated as observers.

The greater objective of WAMZ is to enhance the payment system of goods and services in the zone so as to promote intra-regional trade, the creation of larger regional goods and financial markets, and widening of business opportunities as a means of improving the living standards of the member countries. The facilitation of unhindered movement of persons and labour through the dismantling of barriers to trade were among other objectives stated in the

WAMZ protocol. It was also intended to strengthen the cultural, economic and socio-political cooperation among members. The critical strategy of this project is to adopt common monetary policy architecture and a single central bank as a tool to catalyze the achievement of macroeconomic stability in the region, like the European Monetary Union (EMU) and the CFA zone.

To achieve this project, ECOWAS authority in 2001 established the West African Monetary Institute (WAMI) in Accra, Ghana to design the technical feasibility of the project. WAMI is to be transformed into the West African Central Bank (WACB). In the light of this in 2001, WAMI set out four primary and six secondary convergence criteria as necessary macroeconomic conditions that must be achieved by member countries before the commencement of the project. However, the commencement date of the common currency has been shifted more than three times due to low political support arising from poor macroeconomic performances of some countries in the zone. The first date was 2003 but was reversed to July 1st, 2005. The date was later rescheduled to December 31st, 2009 but has since been rescheduled again to 2014 due to some member countries inability to sufficiently meet with the convergence criteria. This, therefore, offers a better opportunity of assessing the macroeconomic performance of these nations as a pivot to understanding the potential costs and benefits of forming a monetary union in the zone.

2.2 An Overview of the WAMZ Economies

The second West African Monetary Zone (WAMZ) has an estimated population of 180 million people, with Nigeria and Gambia accounting over 85 and less than 2 percents respectively, of the entire population. The zone is endowed with rich and substantial natural and mineral resources like groundnut, diamond, gold, cocoa, bauxite, alumina, and crude oil as well as tourism potentials. Agriculture, forestry, fishing and mining are predominantly the mainstay of the people with agriculture sustaining over 70 percent of the population and contributing approximately 60 percent to gross domestic product (GDP). The mining sector operation carried out in Ghana, Guinea, Nigeria and Sierra Leone engages about 20 percent of the population and contributes on the average over 28 percent to GDP in ECOWAS.

In Guinea, more than 60 percent of the workforce is engaged in mining with a substantial contribution of over 80 percent to total exports and 60 percent to total revenue. Presently, the service sector accounts for over 25 percent of the labour force while the manufacturing subsector employs only less than 6 percent of the entire labour force with almost the same contribution to overall GDP and total revenues due to poor energy supply and infrastructural facilities. Average real gross domestic product (GDP) growth rate per capita between 2002 and 2006, however, varied with Gambia recording 3.7 percent, Ghana 3 percent, Nigeria 3.2 percent, Sierra Leone with the highest GDP per capita of 4.7 percent and Guinea has the lowest of 0.1 percent. GDP per capita was 624, 690, 386, 1418 and 388 per US$ in The Gambia, Ghana, Guinea, Nigeria and Sierra Leone, respectively in 2008 (see, Table 2.1). The other basic indicators of the countries (life expectancy at birth and adult literacy are also evident in the table below.

Generally, the five countries of WAMZ have similar economic structure and characteristics. They are dualistic in nature in both the agricultural, industrial and financial sectors. The agricultural sector is a mixed type of subsistence and modern farming system. The industrial sectors have many informal small-scale dominated firms and few modern firms while the foreign exchange markets are also divided into the official and parallel markets. The economies are exporters of primary products for revenue earnings and importers of manufactured goods from the developed economies of Europe, America and China.

Table 2.1: Basic Indicators for Countries in the WAMZ

Country	population (m)(2009)	GDP per capita '08(US$)	Life Expectancy (2005)	Adult literacy (2007)
The Gambia	2.0	624	56	-
Ghana	23.8	690	57	65
Guinea	10.6	386	54	35
Nigeria	154.7	1418	43	72
Sierra Leone	5.7	388	41	38.1

Source: WDI (2007) and ADI (2010).

2.2.1 The Real Sector

The WAMZ economies witnessed dramatic changes in economic policy and performance. During the first decade after independence, the agricultural sector was the prime mover of these economies in terms of employment, exports and foreign exchange earnings. The economies grew by more than 6 percent on yearly basis. The fiscal and external sectors of these economies were healthy and inflation rates were moderate. Following the surge of oil boom and shocks in the early 1970s, attention shifted to oil and the sustaining agricultural sector witnessed sharp decline both in production and pricing at the international market with adverse effects on the growth of these economies. During the 1980s, the economic conditions of WAMZ nations worsened as the macroeconomic indicators deteriorated sharply. The economies were characterized by severe macroeconomic imbalances due to inappropriate macroeconomic and fiscal policy management response to the general economic recession at the global front. Consequently, output performance in the zone faltered substantially and inflation rate continued to soar.

Real GDP growth rate in WAMZ countries witnessed negative growth between 1981 and 1985. The Gambia posted the highest negative growth rate of 7 percent while Nigeria grew by negative 2 percent in 1984. Output fluctuation continued unabated in the 1990 and 2000 decades despite policy reform interventions during and after the Structural Adjustment Programme (SAP). A major challenge with the real sector in WAMZ has been the inability to diversify the productive base away from the dependence of one or few sectors and products needed for driving economic growth. This critical challenge has been compounded by the poor energy supply and infrastructural deficiencies that could stimulate growth in the private sector. However, since the return to democratic government in some part of the region in the late 1990s and the first half of the 2000 decade, most of the countries have developed and consolidated policy reforms initiatives which have gradually continued to restore the needed private sector led growth.

2.2.2 Fiscal Sector

In response to the fluctuation in output and the continuously changing external sector developments, the fiscal sector in WAMZ can be characterized as buffer. During the wake of the oil boom in the early 1970s, most of the countries embarked on massive and unguided fiscal operations. By the mid and late 1970s, government revenues began to fluctuate due to the fall in

oil prices for the oil producing nation like Nigeria while the prices of non-oil exports became weak due to the neglect of the sectors. These developments led to remarkable fiscal imbalances as revenue declined substantially in the face of rising fiscal expenditure, following several massive investments and construction programmes of the various governments that started from oil boom period. By the end of the 1980s and early 1990s, fiscal deficit and its financing became serious macroeconomic policy challenge to these nations. Fiscal deficit as percentage of GDP increased from a single digit in 1980 to about 11.3 percent in 1986, 11.9 percent in 1987 and 18.3 percent in 1988 in Nigeria, The Gambia and Sierra Leone respectively. Despite considerable efforts and fiscal policy consolidation and adjustment measures, some countries in WAMZ particularly Ghana and Sierra Leone ran budget deficit in most part of the 1990s till mid 2000 periods.

A major consequence of this macroeconomic imbalance is increased external and internal debt crisis management. Public debt to GDP ratio rose from less than 30 percent in early 1990s to over 85 percent in Guinea, Nigeria and Sierra Leone between 1996 and 1999. Since 2004, public debt to GDP in Ghana has remained in upward trajectory due to election activities and the increasing expenditures on rebuilding dilapidated infrastructures and public utilities. This has been complicated by a massive drop in revenue of major export commodities which reflects the weak (revenue) tax base, fluctuating foreign donors grant and undiversified nature of the productive base of these economies. The influence of fiscal dominance became aggravated in some part of the region as the countries efforts to reconstruct and rebuild the civil and politically war damaged economies bolstered fiscal expenditure of the governments. This resulted increased deficits and debt crisis, particularly the war ravaged The Gambia, Guinea and Sierra Leone. Remarkably, corruption in both the public and private sectors exacerbated government expenditure in the case of Nigeria.

In WAMZ, fiscal deficits were financed mainly by borrowing from the individual nations central banks. The central banks resorted to the creation of monetary liability instruments especially seigniorage revenue as the main source of generating money to finance fiscal deficit. For instance, in Guinea, the constitution empowers the central bank to finance deficits of the fiscal sector while other countries central banks also lack instrument autonomies in terms of macroeconomic management. Hence, the monetary sector behaviour responded in similar

fashion as broad money growth showed serious volatility due to the authority's disposition to finance fiscal deficits and mounting external debt.

2.2.3 The Monetary Sector

The history of monetary policy management in the WAMZ sub-region is not different from most countries in the Sub-Saharan Africa (SSA). The region has witnessed two major paradigm shifts, the regulatory era (pre-sap) and deregulatory era (post-sap). The performance of the sector bears similar connection with the kind of policy regime. It is quite revealing that the monetary sector in WAMZ during the 1970s and early 1980s witnessed direct but strict regulation from the monetary authorities. Despite this, the effects on the economies are quite mixed. Though, monetary aggregates were directly managed, money supply growth rates were quite high in some countries even as the growth rate of output recorded prolonged decline, and inflation remained on the upward trajectory particularly in the mid 1980s. Money supply grew from 15.8 percent in 1982 to 51 percent in 1985 in The Gambia, from 23.3 percent in 1982 to 53 percent in 1987 in Ghana, from 9.5 percent to 33 percent in Nigeria during the same period and from 56 percent in 1986 to 74.2 percent in Sierra Leone by the year 1990.

Following the much emphasized regulatory era before the adoption of the structural adjustment programme (SAP) in 1986, the monetary sector, however, has since 1986 witnessed series of reform in all parts of the zone. Yet, the interaction between the monetary sector and the fiscal operations of the various governments did not change paradigm. The relative stability witnessed in the growth of monetary aggregates in the mid 1990s reversed due to pressures from the fiscal sector. Monetary aggregates like broad money supply, money reserves and domestic interest rates maintained rapid increase in the late 1990s and early part of the 2000 decade. This is explained, in large part, by the poor and misguided fiscal operations of the governments. As a result, inflation manifested in the same trajectory with monetary expansion almost in the same magnitude through out the region. For instance, Sierra Leone recorded a high inflation rate of 110.9 percent while Ghana witnessed over 37.3 percent inflation rate in 1990. Subsequently, this macroeconomic imbalance in the system and tight foreign exchange control, led to the rapid expanded parallel market for the trade of foreign exchange. During this period, exchange rate in most of these nations became over-valued and the terms of trade deteriorated sharply.

Between 2000 and 2005, Broad money supply witnessed high volatility in most countries in WAMZ particularly Nigeria and Sierra Leone. Money supply grew by more than 35 percent average during the period 2000 and 2005. This was largely due to increase in liquidity in the system propelled by the increased financial deepening and reform adopted during the period. By the end of the 2006 and 2009, money supply growth rate narrowed due to improved monetary policy surveillance aimed at curtailing inflation and interest rates.

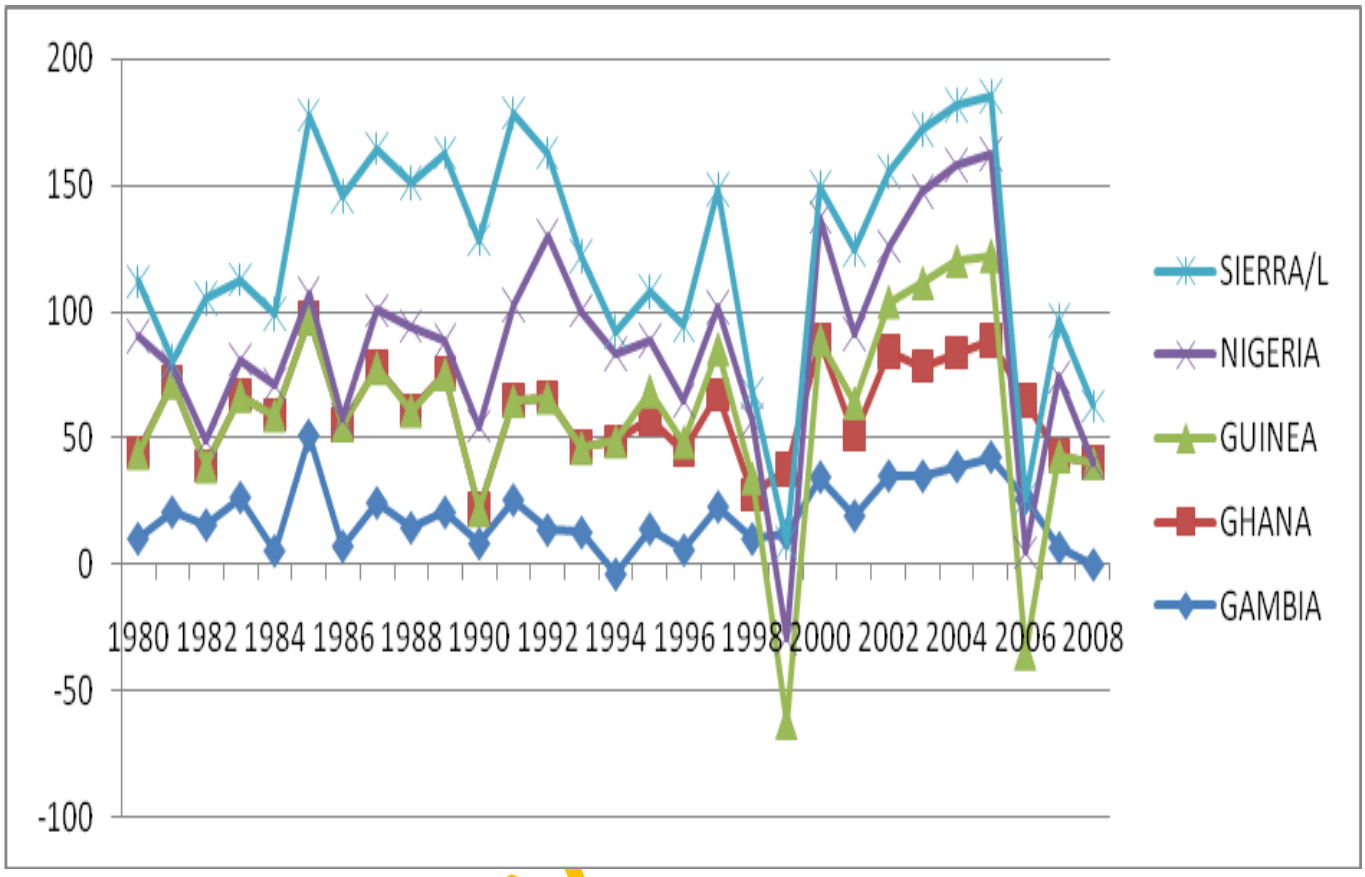

Figure2.1: Money Supply Growth Rate **Source: (IMF, 2009)**

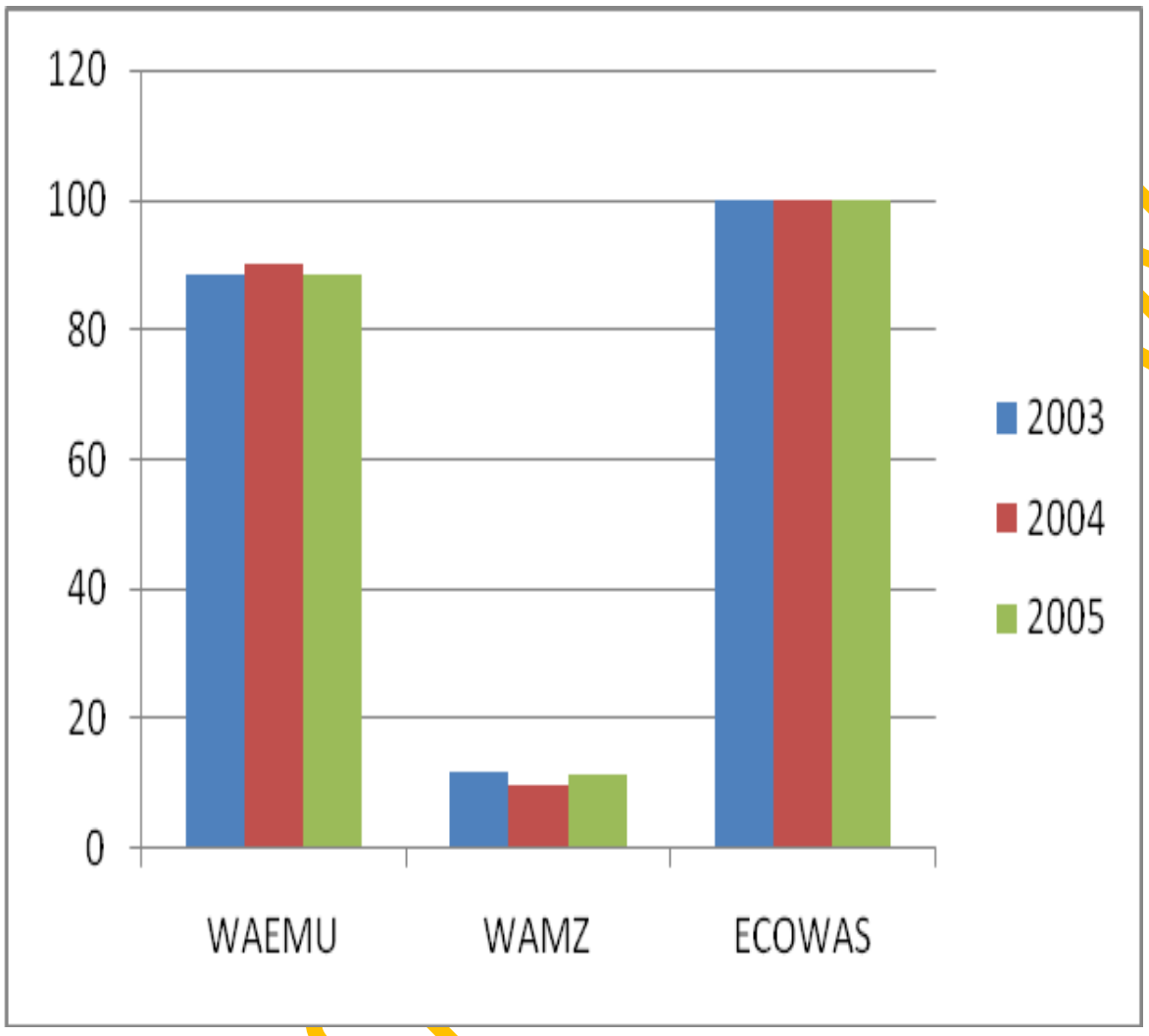

Fig 2.2: Share of Trade in ECOWAS **Source: IMF-DOT (2008)**

2.3 Macroeconomic Framework and Developments

2.3.1 The Gambia

A predominantly agrarian society, the small open developing economy Gambia, has a population of about 2 million in 2008. Agriculture contributed about 43.0 percent of the GDP, 75.0 percent labour force and about 90.0 percent gross domestic earning from exports between 1999 and 2005. It has also witnessed significant fluctuations in national output occasioned by changes in economic policies. The Gambian economy implemented structural adjustment programme in mid 1980s and a three-year Poverty Reduction and Growth Facility (PRGF) covering 1998-2001 with emphasis on the agricultural, education and health sector to improve its citizen's quality of life.

Real GDP growth rate recorded an average growth rate of about 5.8 percent between 2000 and 2004 compared with 3.0 percent achieved in the preceding year, while average inflation rate kept hovering around double digit, apart from the 0.2 and 8.1percent recorded in 2000 and 2001 respectively through out the period 2000 and 2005. In the fiscal aspect, the Gambia economy is known with excessive budget deficits with accommodating monetary sector for the financing of these deficits. The monetary sector have manifested some mixed developments as the rise and fall of the inflation levels have always maintained similar trajectory with the changes in money supply and interest rate. The external sector developments and performances overtime also mirror the weak economic base of the country as the country exports solely primary products.

The Real Sector Developments and Performance

The performance of the real sector bears a closer relationship with the output of the agricultural subsector and other factors that aid growth. Since independence, The Gambian economy has witnessed mixed performances due to changes in its economic policy. In the 1960s, output growth was modest following the broad stable macroeconomic conditions until the 1970s, when economic performance deteriorated significantly as a result of inappropriate domestic policies and deterioration in the domestic and international terms of trade and adverse effects of the oil shock. The decline in output growth and loss of competitiveness in the external sector continued and worsen the economic performance till the period 1980, when the Economic Recovery Programme (ERP) was adopted in 1986. The Gambian economy recorded a moderate

average output growth rate of 2.5 percent between 1986 and 1993. This compared to an average negative growth rate of 1.5 percent between 1977 and 1985, followed from the (SAP) reform package. An important factor that contributed to this is the service sector which is strongly influenced by the re-export trade and tourism while the contribution of the agricultural sector to gross domestic income declined during this period. The GDP value-added from construction, electricity and water have been on an increasing trend, while the industrial sector remains narrow because of the thin and weak manufacturing base.

Following the 1994 military coup, real output growth slowed substantially during 1993-1996, as over 60 percent downturn in tourism activities and poor rainfall that affected agricultural output was directly evident. This was exacerbated by the withdrawal of foreign donors during the transition period. Consequently, average real growth declined by 2.5 percent. However, growth rebounded significantly during 1997-2001 due to policy reform that preceded the general election. Output growth increased from 4.1 percent in 1996 to 5.0 percent in 1997 and maintained an average real growth of 3.9 percent between 1995 and 2000. The agricultural sector was the critical catalyst to this as a result of successive good rains and bumper harvest which further attracted the foreign donors.

Despite the improved economic performance, the economy remained weak and highly vulnerable to external shock due primarily to the volatile nature of its major sources of growth (re-exports, groundnut exports and tourism. Real GDP growth shrank by 3 percent in 2002 as a result of spell of drought. During 2003 and 2006, average real GDP growth reached 7 percent with an annual growth rate of 4.7 percent during the period 2001 and 2006. This was because climatic conditions improved favourably, and the construction sector witnessed a boom.

Prices as measured by the consumer price index increased by about 2.6 percent per annum during 1998-2001. Generally, the recovery ushered in by the democratic election in the late 1990s helped in containing inflation around 2.8 percent average during the period 1995 and 2000. However, by the end of December 2002, prices had risen to 13.0 percent and subsequently to 18.0 percent in 2003. The factors that accounted for the acceleration of CPI inflation during 2002 and 2003 were liquidity injection and the depreciation of the nominal and effective exchange rate of Dalasi. However, inflation reduced to low single digit level during 2004 and

2008 due to tight monetary policy initiated in 2003 following the increasing surveillance imposed by the convergence council of WAMZ.

Fiscal Developments and Processes

The fiscal stance of The Gambia relies significantly on the revenues from tax, tourism and exports which are relatively narrow. This is usually complemented with foreign aids. The fiscal policy stance during the transition period (1994-1996) was expansionary which resulted in a large and unsustainable fiscal deficit. In the aftermath of the military take over, excess spending put pressure on interest rate led to crowding out of investment. This was part of the reason for introducing some structural policies. Under the Enhanced Structural Adjustment Facility (ESAF 1998-2001) supported by the IMF, expenditures were contained and revenue mobilization improved, leading to a significant improvement in government fiscal operations. The pre-shipment inspection (PSI) scheme introduced in 1999 had adverse impact on indirect taxes, particularly taxes on international trade. External tariffs fell with significant drop in The Gambian revenue profile. Consequently, the conduct and impact of fiscal policy deteriorated during 2000-2002. Fiscal deficit excluding grants rose rapidly from 3.7 percent in 2000 to 15.0 percent in 2001 reaching a total average of 7.65 percent during 2001 and 2006.

Poor domestic revenue mobilization and lack of direct budgetary support from donors led to increased government borrowing from the central bank to finance her fiscal deficits. In response, government introduced the National Emergency Fiscal Committee (NEFCOM) in 2002 to rationalize non-statutory expenditures and to control government commitments. Fiscal consolidation improved markedly under this arrangement. Government also enacted budget management and accountability Act (2004) to enhance budget formulation and execution and the regulations to implement the laws are being implemented. Another fiscal reform initiative was the adoption of the Medium Term Expenditure Framework (MTEF) introduced by the IMF to help countries with poor spending pattern. The overall fiscal performance improved this period with fiscal deficit excluding grants narrowed to 2.7 percent in 2006. The implementation of the Integrated Financial Management System in 2007 has further reduced fiscal deficit excluding grant to 1.0 in 2007 with a minor increase to 1.8 percent in 2008 which was due to some developments associated with government spending unparallel to its revenue. A driving force to this initiative is the effort to attain the fiscal status of the convergence council of WAMZ.

Monetary Policy Developments and Performance

The central bank of The Gambia (CBG) has the sole right of managing and regulating monetary policies. The Gambian economy witnessed strict regulation under the direct instruments applied by the bank before the structural adjustment programme. The bank adopted indirect monetary policy framework in the context of the economic and financial reforms undertaken since 1986. In 1987, a treasury bills market (money market) was introduced to facilitate the migration to indirect instruments in the conduct of monetary policy from the use of direct instruments, i.e., selective control of credits.

Since 2002, the CBG applies weekly auctioning of treasury and central bank bills through primary dealers for both government deficit financing and control of money supply. CBG utilizes the monetary targeting framework to pursue its price stability objective, and uses its rediscount rate to signal changes in its policy stance. The commercial banks choose their own deposit and lending rates without strings attached. CBG sets an intermediate target for growth in broad money (the nominal anchor of the system) while reserve money is used as operational target. In 2004, the bank set up the Monetary Policy Committee (MPC) to oversee monetary policy design and implementation, and ensure that the price stability objective is given prominence in the monetary and exchange rate activities of the Bank. Since its establishment, the MPC have defined price stability as its core mandate by reporting inflation and other key indicators underlining price developments. Following this innovation, the main instrument used by the CBG to influence the path of reserve money is the issuance of treasury bills. The independence of the bank in the conduct of monetary policy has been enhanced under the revised statute of the bank established in 2005, which prescribed price stability as the overriding mandate of the bank. In 2006, a 7-day deposit instrument was also introduced to separate the Gambian fiscal operations from the monetary operations to boost the bank independence. Most of these achievements stem from the increasing effort to fully implement the WAMZ protocols.

In terms of monetary aggregates and performance, the growth rate of broad money supply remained largely in line with the trend of the nominal GDP growth especially, in the period before 1996. In 1997, however, the growth rate of broad money rose sharply to 23 .0 percent from 5.8 percent in 1996. Credit to the private sector, notably in the trade and tourism sectors and crop credit expanded by 27.0 percent indicating that confidence had returned after transition

to civil rule in 1996. However, between 1998 and 2001, broad money growth contrasted to an average of 19.1 percent. During 1999, broad money grew by 10.0 percent with 2.0 percentage points below the programmed target due to net increase in domestic assets. Within a span of two years (2002-2003) broad money and narrow money growth on average increased to an unprecedented rate of 39.4 and 47.1 percent respectively. In general, broad money supply as a percentage of GDP reached over 37.7 percent average growth rate during 2001 and 2006 period from about 27 percent average recorded between 1995 and 2000. Fiscal dominance accounted for much of the surge in money supply. Substantial losses incurred by the central bank through its conduct of foreign exchange transactions also contributed to the excessive monetary growth. The tight monetary policy adopted by the CBG has, however, reversed the trend to a moderate rate in 2009.

External Sector Developments and Performance

The external sector of The Gambia also witnessed dramatic changes in both policies and performances. The economic structure of the Gambian economy relied solely on the exports of primary products (ground nut and re-export of tourism services) which account for over 70 percent of total foreign exchange earnings. Perhaps, the sector has continued to battle with low pricing challenges in the international market despite the increasing effort in diversifying her export base. Weak trade interaction in terms of exports against the ever increasing import dependence resulted in negative terms of trade shocks, exports volatility and instability in the domestic economy in the 1980s.

In the aftermath of the successive coups between 1995 and 1998, tourist receipts dropped because of the negative travel advice issued by the European countries. Donors also suspended support to Gambia and the foreign exchange market was adversely affected. The Gambia's external position generally weakened, albeit substantially as current account excluding transfers averaged 13.7 percent of GDP during the period. The external trade sector, especially the re-export trade component, contrasted by 6 percent and the value of total exports declined by 9 percent in 1999. During the period 2000-2004, the current account deficit, excluding official transfers increased to 14 percent of GDP. In nominal terms, the current account worsened from US$39.5 million in 2000 to US$42.2 million in 2001 and further to US$49.5 million in 2002. The current account deficits rose to US$58.9 million in 2004 after a slight decline in 2003.

Evidently, this unfavourable development reflects the large imports in oil products and depressed export receipts owing mainly to the drought induced decline in groundnut export particularly in 2003. The capital account balance fluctuated widely during the period as it exhibited a marked deteriorating trend. The sharp decline in capital account balance was explained by large decrease in short-term (net capital) and supplier's credit. The trend, however, reversed in 2004 following the surge of foreign direct investment (net) that characterized the financial and tourism sector as the overall capital account balance increased to US$46 million by the year end 2004 (WAMI, 2005).

During the highly regulatory era of the financial system, exchange rate was administered strictly by the central bank of Gambia. However, exchange rate was later liberalized, following the financial and external sector reform brought in by the structural adjustment programme (SAP) period in 1986. Exchange rate control and restrictions on current and capital accounts were abolished. A major development was the introduction of an inter-bank foreign exchange market under the floating exchange rate arrangement. Evidently, exchange rate remained fairly stable at the beginning of the reform programme till 1998 especially after the depreciation of the CFA franc in 1994. In 1999, the nominal exchange rate of Dalasi depreciated against the US dollars by 4.6 percent due to the high demand of Dalasi by the European tourist. The exchange rate of Dalasi has remained fairly stable since 2005 to 2009 due to stability of key monetary aggregates.

Between 2000 and 2003, the Gambia rationalized the structure of its tariffs by reducing its maximum tariff rate from 20 percent to 18 percent and the number of bands from 8 to 4. Accordingly, this brought down the import-weighted average tariff from 12.0 percent to 11.8 percent which caused excessive monetary growth and slack in fiscal policy operations. Change in the consumer price index (inflation) increased as the nominal effective exchange rate depreciated by 12.0 in 2001 and continued till 2003 on the average of 25 percent. The implementation of ECOWAS CET in 2006 meant that the country had to adjust its upper band of 18.0 percent to 20 .0 percent. This led to increase in sale tax receipts on imports on one hand but adversely affected the profitability of the re-export trade on the other hand. In terms of gross reserve, the Gambia witnessed a fall in 2001 and 2002 as a result of the shortfall in the disbursement of donor grants and decline in private capital inflows. There was substantial improvement in overall gross

reserve in 2004 and 2005 when private capital flows in the financial and tourism subsectors became prominent.

2.3.2 Ghana:

Macroeconomic Developments and Performance

Ghana has an estimated population of about 23.4 million in 2008, and is an agriculturally predominant society known for the production of cocoa and gold. Generally, agriculture contributes over 60 percent of the total national income in Ghana, while the share of manufacturing is around 28 percent of GDP during the period 2000 and 2004. The external sector of Ghana constitutes largely an array of tradable agricultural and extractive products exported to different parts of the world and net importer of finished goods. In the area of economic management, the Ghanaian economy has witnessed structural adjustment programmes anchored on building an effective market system to correct the macro imbalances recorded particularly in the 1980s. The outcomes therein were mixed due to the inability to sustain such resurgent policy programmes. The Ghanaian economy has also embraced assortment of policy reconstruction programmes. These programmes include the Medium Term Expenditure Framework (MTEF), the Enhanced Structural Adjustment Programme (ESAF) and the HIPC initiative of the international monetary fund (IMF). The aim is to generate a broad based economic growth. The monetary and fiscal policy performances of Ghana suggest the prevalence of fiscal dominance with accommodating monetary sector. There is little or no policy (instrument) autonomy on the part of the central bank of Ghana.

Real sector Developments and Performance

Stemming from a large economic imbalance in the early 1990s, Ghana's macroeconomic performance has been mixed with considerable improvement since 1997. Real GDP growth rate increased from 4.2 percent in 1997 to 4.7 percent in 1998 but declined to 3.7 percent in 2000, which was the lowest in that decade. This was followed closely by a marked improvement as real GDP growth rate improved consistently from 3.7 percent in 2000 to 5.8 percent in 2004 before the peak at 6.2 percent in 2006 in spite of the energy crisis witnessed during the period. The critical factors have been the expansion in cocoa production, improvement in the mining as well as the expansion in the service sectors.

Growth in agriculture was at the average of 6.0 percent during the period 2000 and 2004.The contribution of agriculture to overall growth in the GDP maintained a steady increase from about 31.6 percent in 2000 to 46.7 percent in 2004. During this period, the production of gold witnessed a sharp fall due to structural problems but the price maintained relative stability. The improved performance in real sector was due to favourable response to the mass spraying incentive offered to cocoa farmers against black-pod disease of cocoa during the period.

In terms of inflation, the consumer price inflation in Ghana has been mixed. Inflation rate has been notably high in the 1990s. It rose sharply from about 27 percent in 1997 to 40.5 in 2000 before falling to 15.2 percent in 2002 due to complementary fiscal operation of the government, but rising again to 23.6 percent in 2003 following the 95 percent hike in prices of petroleum product. Inflation rate eased to 11. 8 percent in 2004 and has since remained a double digit between 2007 and 2009. Inflation in Ghana remains largely responsive to changes in money supply and fiscal deficit financing from the Ghana's central bank.

Fiscal Developments and Performance

Broadly, the fiscal stance of Ghana heavily depends on tax revenue, export tax, and external grant which are relatively weak. In the period 1990s, unfavourable global economic condition impacted significantly on the Ghana's economy particularly, on the government fiscal position, balance of payment and the exchange rate. The prices of cocoa and gold fell precipitously with negative effects on the fiscal stance. Thus, fiscal deficit became quite exemplified in the late 1990s which influenced the government to adopt the IMF induced Medium Term Expenditure Framework (MTEF) for budgeting in 1999, while value added tax at 10 percent was introduced in late 1998.

Evidently, fiscal deficit to GDP which stood at 2.6 percent average between 1995 and 2000 due to fiscal consolidation process initiative in government's budget programmes witnessed a dramatic shift to about 9.25 percent average during 2001 and 2006. The overall budget deficit (excluding grant and HIPC assistance) on annual basis rose from 9.9 percent of GDP in 1997 to 10.1 percent and 13.2 percent in 2000 and 2001 respectively. It declined to 7.7 in 2003 and 6.9 percent in 2005. However, fiscal deficit to GDP has risen sharply to double digit since 2006 due to negative effects of seigniorage financing mechanism. The domestic primary balance

accounted for about 3.2 percent and 3.6 percent of GDP in1997 and 1998 respectively. This was reversed following an improved deficit record from 2.4 percent in 2000 to 2.2 percent and 0.6 percent between 2003 and 2004. However, the trend has reversed to a higher value since 2005 due to volatility in government revenue and grants as total expenditure as a percentage of GDP continued to expand. Despite consolidated policy measures, fiscal deficit in Ghana has continued to hover above 15 percent between 2006 and 2009. Total revenue to GDP increased from 20.8 percent in 2003 to 23.8 percent in 2004 with increment in recurrent expenditure. This is not unconnected to increased domestic interest payment. In the same period, the total expenditure to GDP recorded 33.3 percent compared with the 30.7 and 26.6 percent performance in 2001 and 2002 respectively, showing 13.5 percent deficit in 2004. The rise in government expenditure leaned heavily on foreign finance component of the HIPC initiative and debt financed instruments. Domestic debt to GDP has also risen far above the level attained in 2003.

As a result of the debt cancellation associated with the HIPC initiative, net domestic financing of the government was 0.5 percent of GDP in 2004 against the 2.2 percent target of GDP. Yet, external debt remained on a high double digit figure in Ghana around 2007. From the debt/GDP ratio of 28.2 percent in 2000, the ratio declined slightly to 26 percent in 2001, but debt to GDP rose again to 28.2 percent in 2002 and hover over and above 20 percent through 2003 and 2008. The Ghana Petroleum Finance Bond set up in 2004 was an evident to this development. Similarly, the banking system holding of government debt instruments averaged 68.1 percent, while that of the non-bank holding accounted for 31.9 percent during the same period. However, there was a marked shift from 58.4 percent to 75.1 percent in 2004 of the banks holding instrument as a result of the unattractive nature of the Ghanaian government debt instrument and the declining interest rate.

Monetary Developments and Performance

The central bank of Ghana (CBG) manages and regulates monetary policy with the primary goal of achieving price stability. The bank's monetary policy stance has been mixed with intermittent adjustment mechanisms reflecting the changing macroeconomic environment. The economy witnessed strict regulation, under the direct instruments applied by the bank before the structural adjustment programme. The bank has also adopted indirect monetary policy framework in the context of the economic and financial reforms undertaken since 1986. Under

this liberalized framework, monetary policy management in Ghana has been quite flexible. A remarkable implication of loose monetary policy measure in Ghana is evident. Broad money supply to GDP grew by 20.4 percent average between 1995 and 2000 and further grew by a high rate of 26.32 percent between 2001 and 2006. This was due, in part, to increasing reliance on money reserve. The growth rate of reserve money rose from 33 percent in 1997 to a peak of 42.6 percent in 2002 but fluctuated significantly during 2003 and 2008, a reaction to the changes in macroeconomic environment. The lowest points were 17 percent in 1998 and 11.2 percent in 2005. These trends excessively exceeded the programme targets.

In 2006, reserve money grew by 32.3 percent exceeding the 11.2 percent growth in 2005 and the programmed 19.7 percent for the year. The 32.3 percent in 2005 is substantially higher than the average growth rate of 21.0 percent for the preceding three years. Thus, the growth rate of broad money supply attained the highest levels between 2000 and 2002 (I-PRSP period) by an average of 51 percent. This was significantly different from the 18 percent recorded in 1998. Money supply growth rate stood at 48 percent in 2000 declined to 41.5 percent in 2001 and rose again to 50.0 percent in 2002 percent. By the year 2004, broad money supply in Ghana fell to 26.0 percent from 35.8 percent in 2003. The tight monetary policy induced by the PRSP initiative and the mutual surveillance from the WAMI convergent target were the critical factors that caused the reduction in money supply. However, higher net foreign assets of the banking system and private sector credit mainly drove M2 above the growth rate in nominal GDP. Credit to private sector expanded by 31 percent during 1998 and 43.0 percent in 2006 which was substantially higher than nominal GDP growth rate. Commercial bank lending interest rate however, dropped gradually from 47.0 percent in 2000 to 38.5 percent in 2002 and further to 28.7 percent in 2004. This high cost of capital adversely affected access to loans among small scale enterprises and the growth rate of the private sector was stifled.

The effort to stem inflation had also redirected the focus of the central bank of Ghana to pursue interest rate policy targets. The bank reduced its prime bank rate by 150 basis points from 21.5 percent to 20 percent in February in 2004 and further to 18.9 percent by May that same year. The emphasis was to reduce inflation, curtail the growth of broad money, improve the government revenue base and maintain exchange rate stability. Yet, inflation remains at a double digit due to fiscal deficit financing and external borrowing as well as the critical dependence on

external grants. During 2005 and 2009, the growth rate of broad money soared above 28 percent annual growth rate despite consolidated policy efforts due to the increasing demand for monetary financing of the fiscal operations.

External Sector Developments and Performance

The external sector performance has been mixed, though it exhibited considerable resilience during the 1990s and the first half of 2000 decade. Prior to the general economic recession witnessed between 1994 and1996, there was a strong export growth performance in Ghana propelled by improvement in cocoa and gold which accounted for about 70 percent export earnings. Between 2000 and 2004, both commodities accounted an average of 69.2 percent of total export earnings .While cocoa export increased in both volume and value, gold export volume remained flat in most part of the period under review except few periods price increased in the international market. Thus, the external sector in Ghana is characterized with vulnerable terms of trade shocks, as Ghana exports performance depend largely on exports of the two commodities subject to frequent environmental and global market challenges.

In terms of imports, Ghana depends on the importation of capital and intermediate goods which accounted for over 65.0 percent of GDP on the average between 2000 and 2005. This is far higher than the export that is at the average of about 33 percent of GDP during the same period which impacted negatively on the current account. Current account deficit including grant targeted at 3.5 percent stood above 5 percent in 1997, and have considerably increased between 2000 and 2006. The depreciation of the Ghanaian cedi was also noticed. In 1998, cedi depreciated against the US dollar by about 12.9 percent, rising steeply to an unprecedented and alarming rate of 104.4 percent in 2000 due to developments in the external environment. The exchange rate of Ghana witnessed significant decline through out 2000 and 2007, the exceptions were the 10.6 and 13.8 percents depreciation recorded in 2002 and 2005. This trend was not unconnected to the foreign exchange market liberalization that changed dramatically after these periods. These factors motivated the redenomination of the cedi in 2007. The overall balance of payment performance in Ghana has been mixed as deficit was apparently noticed especially between 2000 and 2004 owing to trade deficit.

2.3.3 Guinea:

Macroeconomic Developments Performance

Guinea is a francophone West African nation. It is known for the mining of bauxite, alumina, diamond and gold, but with a weak agricultural base. The population is about 9 million and over 80 percent of its export volume and about 70 percent revenue are generated from the mining sector. The predominant agricultural activities include farming, animal husbandry, fishing and forestry which contribute less than 20 percent of Guinea's GDP. The structure of its fiscal and monetary policy also accommodates the central bank financing of budget deficit as external grant to GDP ratio in Guinea is one of the highest in the sub-region. Guinea has also implemented the IMF and the World Bank supported economic and financial reform programmes to address the macroeconomic challenges. These programmes could not yield the desired result.

Real Sector Developments and Performance

The performance of Guinea over the years has critical nexus with its economic structure. The major component of its GDP include agriculture, mining and tertiary sector. Mining of bauxite, alumina, diamond and gold is a prominent economic activity in Guinea. The mining sub-sector accounts for over 80 percent of the total volume of exports, 60 percent of the state revenue and more than 60 percent of the workforce are engaged in mining. The nation depends on these primary products for domestic consumption, exports and foreign exchange. A major development witnessed globally in the mid and late 1980s was the general fall in the prices of most primary products in the international market which adversely affected the economic performances of most developing countries in Africa. This led to the structural adjustment programme which was aimed at diversifying the productive base of the economy and the creation of market-driven economies in 1986.The disengagement of the state from production and trading activities as well as the private sector promotion favoured the recovery of growth after a long period of economic stagnation. Real GDP recorded an annual growth rate of 4.3 percent in 1990. It rose to 4.7 percent in 1993 and 4.8 percent in 1998 following the moderate recovery effects after SAP. However, GDP growth rate fell to 3.7 percent owing to the fall in the world prices of alumina and the adverse effects of political instability and civil wars in the neighbouring

countries of Guinea. Agriculture contributed more than 20 percent to GDP between 1994 and 1999 as over 87 percent of the nation's work force is engaged in these activities.

Real GDP growth rate which stood at 3.7 and 4.2 percents in 2001 and 2002 respectively, declined to 1.2 percent in 2003, but recovered slightly to 2.7 percent in 2004. Unfavourable weather conditions, pest infections, low input supplies of water and electricity, rising prices of petroleum products and the decline in the world market price of the country's main export, bauxite were the factors that led to the decline in GDP during this period. Though, the agricultural sector improved considerably, the manufacturing sector deteriorated significantly between 2003 and 2004 due to structural constraint that affected the sector.

At the wake of the IMF and World Bank supported reform package in 1986, inflation rate reached 71.8 percent, but fell markedly to 7.1percent in 1993 and 4.6 percent in 1999. The inability to control excessive liquidity arising from fiscal deficit financing and seigniorage revenue reversed the trend. Inflation rate in Guinea has remained at a double digit figure since the year 2000. By 2004 inflation surged to 27.6 percent with an average rate of 23 percent between 2003 and 2007. The unsterilized nature of the foreign exchange market and the continuous depreciation of the Guinea francs were among other factors that caused inflation.

Fiscal Developments and Performance

The fiscal sector performance of Guinea bears close nexus with its revenue base. The economy depends on the foreign exchange earning from the primary products export and mining operation as well as donors grant. The vagaries of the price of these products mirror the changing revenue profile of Guinea. After the deep economic recession in the 1980s till the late 1990s, the world price of alumina fell in the international market with some negative implications for Guinea's revenue.

However, Guinea's fiscal expenditure continued to rise with primary fiscal balance accumulating deficits. This was largely financed through the policy instruments of the monetary sector. There is a clause in the Guinean constitution that empowers the central bank to finance the deficits of the government. By 1997, the public debt ratio to GDP was 80.4 percent and accelerated to 90.7 percent in 1998 before it declined slightly to 82.1percent 1999. Fiscal deficit to GDP also increased from 5.3 percent to 6.9 percent in 2003, while the central bank financing

of deficit as percentage of GDP increased from 16.1 percent in 2003 to 23.1 and 81.6 in 2004 and 2006 percents respectively. Total expenditure and net-lending was above 18 percent of GDP in 2004. During this period, expenditure overrun, significant revenue leakages as a result of weak tax administration, tax evasion, fraud and decline in donors' assistance were responsible for the poor performance.

Monetary sector Developments and Performance

The central bank of Guinea (GCB) has the responsibility of controlling and regulating the costs and volume of credits and monetary policy management. The economy which is outside the UEMOA monetary union has moved from the directly regulated framework to the indirect market-based approach of monetary policy management introduced in 1986. The overall objective was to improve the competitiveness of the economy through increased private sector participation. Hence, interest rates and exchange rates were liberalized by the central bank. The bank introduced monetary policy instruments like mandatory reserves, treasury bonds, and open market operation to regulate and control liquidity in the economy. The bank focused on the target of monetary aggregate growth as the anchor of monetary policy management to fight inflation. However, monetary policy was largely influenced by developments in the fiscal sector. Guinea witnessed continuous but substantial fiscal deficit in the 1990s till the first half of the 2000 decade and monetary policy became passive and expansionary to finance deficits in the fiscal sector.

Between 2000 and 2004, the growth rate of money supply increased markedly, with an average growth rate of 26.0 percent during the period. Broad money growth increased from 35.3 in 2003 to 37.0 percent in 2004 as government fiscal expansion became uncontrollable. Between 2006 and 2008, money growth had responded positively to WAMZ's target due to increasing surveillance to achieve the convergence criteria. The net foreign asset also witnessed dramatic change following the improvement on the part of the banking sector. Net foreign asset NFA rose from GNF46.3 billion in 2003 to GNF169.9 billion in 2004 but had faltered due to inconsistencies with policies and programmes implementation.

External Sector Developments and Performance

The external sector position of Guinea is poor albeit data constraints. Balance of payment deficit increased from US$31.5 million in 2002 to US$46.8 and US$48.2 in 2003 and 2004 respectively. Despite imports contraction in 2003, the current account balance worsened owing to significant high deficit recorded on net-income and transfer at both the official and private categories.

The Guinean Franc experienced relative stability between 2000 and 2004 as a result of administrative control. The removal of the market determined price at the parallel market to reduce the market premium and reverse the decline in the official reserve created disincentive to the inflow of and repatriation of exports proceeds into the auction market. Exports growth stifled and the overall external sector deteriorated with donors suspending their budgetary assistance and external debt relief towards the end of 2004.

2.3.4 Nigeria:

Macroeconomic Developments and Performance

Nigeria is about 150 million in population and constitutes over 75 percent of the entire market in WAMZ. It is one of the highest exporters of crude oil in the international oil market and richly endowed with huge agricultural resources. Nigeria also has the second biggest GDP in Africa after South Africa. Although agriculture contributed over 80 percent revenue and was the predominant employer of labour in the 1960s and early 1970s, agriculture has been neglected. This is as a result of the discovery of oil in commercial quantity supported by the oil boom since 1970. Presently the contribution of oil is about 95 percent of the gross domestic product and over 92 percent export earning for Nigeria. The level of non-oil export (primary products) have substantially declined due to a number internal and external factors while Nigeria remains an importer of manufactured products from the developed economies of China, EU and the US.

Nigeria's level of intra-regional trade among member countries of WAMZ is relatively smaller than most other regions of the world. Output growth fluctuations, staggering inflation levels and fiscal deficit financing are key macroeconomic problems that often pose challenges to the authorities. However, countercyclical policy measures have at different times been adopted

especially the structural adjustment programme and the incipient economic reform programmes pursued since 1999.

Real Sector Developments and Performance

The trend and pattern of basic macroeconomic and social indicators reveal that Nigeria has been a country of mixed blessings, as economic performances reflected the structure and policy pursuit overtime. Following the negative growth rate in the 1970s and 1980s associated with the external sector vulnerability, the structural reform programme introduced in the mid 1980s induced marginal growth of the real GDP in the early 1990s. Over the period 1992 and 1998, annual GDP growth averaged about 2.25 percent. Oil production coupled with the return to democratic rule in 1999, the GDP grew considerably. Real GDP growth increased to 4.5 percent average in 2002 and accelerated to 10.4 percent in 2003. This was a response on the NEEDS document but later declined to 7.9 and 6.7 percent in 2004 and 2006 respectively due to fall in manufacturing sector and shortfall in power supply. Between 2006 and 2008, growth rate of GDP hovered around the average of 5.2 percent, a period associated with boom in the financial sector before the wake of the global financial crisis. Owing to failures of the power sector, the manufacturing sector contributed less than 5 percent to the growth of GDP in 2004 and fell less than 2 percent on 2007 and 2009 respectively.

On the year-on-year basis, the all-item consumer price index (CPI) was quite revealing. Between 1992 and 1996, the inflation rate was at 44.6 percent in 1992 and rose rapidly to 57.2 and 57.0 percent in 1993 and 1994 respectively. It rose to an alarming rate of 72 percent in 1995 before it fell to 29 percent in 1996. The concomitant rise in money supply and other structural problems accounted for this phenomenon. The trend, however, reversed between 1997 and 2000 due to structural reform programmes of the government hovering around the average of 9.5 during this period. There was a dramatic change as inflation rose from 14.6 percent in 2000 to 16.5 percent in 2001 to due to fiscal expansion. Although, inflation rate declined to 12.1 percent in 2002, by the year end 2003, inflation rate reached 23.8 percent as a result of growth in monetary aggregate and fiscal expansion of the government. Between 2004 and 2008, inflation rate remained fairly stable hovering around an average of 10 percent except 2005 and 2008 with inflation rate of 11.4 and 10.6 percent respectively.

The fiscal reform strategy under the Medium Term Expenditure Framework (MTEF), the Nigeria due process initiative as well as the IMF policy support strategy placed restraint on inflation since 2004. Thus, inflation rate has remained almost single digit and responded closely to changes in money supply and government fiscal expenditure.

Fiscal Developments and Performance

The Nigerian fiscal stance bears a closer nexus with the volume of crude oil export and the prices at the international market. However, from 1990 to 1994, there was general economic recession at the global front which affected the fiscal stance. Thus, fiscal deficit and inflation were evident. Nigeria ran a reflationary budget in the late 1980 and early 1990 to cushion the impact of economic liberalization on the most vulnerable groups in the society. This put pressure on the central bank to finance the components of the budget that were in excess of the available resources. Revenue from various tax components as a percentage of GDP was insignificant due to weak tax base and poor administration. The budget deficit as a percentage of GDP rose from 11 percent in 1991 to 15.5 percent in 1993. In the wake of democratic rule in 1999, government fiscal operation witnessed a dramatic change by almost 60 percent. The sharp rise in the price of crude oil and the quest to improve decaying infrastructures led to this development.

However, budget deficit to GDP remained fairly stable to a low single digit value on the average through out the period 2000 to 2005. The total government revenue amounted to N3, 920.5 billion or 43.6 percent of GDP in 2004 compared with N2, 575.1billion or 36.0 percent in 2003. Comparatively, the total government expenditure was N3, 062.8 billion or 34.1 percent in 2004 as against the N2, 655.0 billion expended in 2003. Although tax to GDP improved fairly this period, oil proceeds were quite significant and indicative. The fiscal process was strengthened through enhanced budget control mechanisms including the Medium Term Expenditure Framework (MTEF), the due process initiative as well as the surveillance effort of the convergence council of WAMZ.

Monetary Developments and Performance

The Central Bank of Nigeria (CBN) manages and regulates monetary policy with the primary goal of achieving price stability. The bank's monetary policy objective remains the attainment of internal and external balance. A remarkable development is the shift from direct

and tight regulatory framework to the indirect market based framework under the structural adjustment programme (SAP) in 1986. The aim was to induce a market-oriented financial system for effective mobilization of financial savings and efficient resource allocation. The main instrument of the market-based approach is the open market operation (OMO) and it is complimented by reserve requirements and discount window operation. The main option of economic management was the control of monetary aggregates to influence economic growth but the inflationary consequences of money supply dynamics became challenging.

Thus, the central bank of Nigeria introduced a new policy framework on the market driven interest rate management in 2006. This regime is called the Monetary Policy Rate (MPR) which replaced the Minimum Rediscounting Rate (MRR) which commercial banks use to obtain credits from the central bank. The policy is designed to bring down lending interest rate within the range of 7 and 13 percent. The main operating principle of the new regime is to control the supply settlement of balances of banks and make the banking system target zero balances at the central bank to engender systemic treatment of deficits and surpluses in the settlement accounts. Under this arrangement, the cost of overdraft at the CBN would be equal to the opportunity cost of holding a surplus balance with the CBN for any bank. The central bank in 2006 further explained that the MPR would be set at 10 percent using current rate of inflation and the target expected 9 percent inflation rate for the fiscal year as a guide to ensure that interest rate remains positive in real term. The reform was also extended to discounting window activities through which the Central bank of Nigerian opened up windows as market instrument for discounting debt instrument in the bank. Market operators such as deposit money banks (DMBs) and discount houses that are in need of liquidity to tidy up their books were allowed access. At the heart of this reform programme, the central bank of Nigeria independence act was passed in 2007 to enhance instrument autonomy. Thus, this shifted emphasis to the inflation targeting framework as the interest rate became a major instrument of monetary policy management strategy. The monetary policy committee meets quarterly to review monetary policy guidelines.

In terms of performance, the growth of monetary aggregate has shown significant volatility. The growth rate of money supply fell considerably to 32.7 percent in 1990 from about 46.1 percent in 1985 indicating the effect of paradigm shift from the direct framework to the market base approach. Though the growth rate of M2 increased to 53.8 percent and later fell to

34.5 percent in 1994 and 1995 respectively. By the year end 2001, the growth rate of money supply had risen again to 48.1 before the marginal fall to 40.0 percent in 2005. A critical factor remains the expansionary fiscal operation of the government and the rapid changes in the crude oil prices in the international market. Evidently, inflation has continued to follow the systematic behaviour of monetary aggregate in Nigeria. Following the developments associated with new regime of monetary policy management in 2006, inflation rate has been substantially underpinned and the lending interest rate also responded in relative term. However, the lending interest rate remains high above the single digit target between 2006 and 2008. The central bank financing of fiscal deficit was a known feature particularly between 1994 and 1999. This has further reduced following the target of the convergence council of the second ECOWAS monetary zone in 2001.

External Sector Developments and Performance

The Nigeria external sector also witnessed dramatic changes both in policies and performance. The agricultural sector which dominated exports in the 1960s gave way to the oil sector. Since 1996 the oil sector accounts for over 92 percent and 98 percent in total revenue and foreign exchange. Oil prices remained high and averaged $29.2 and $37 per barrel in 2003 and 2004 respectively and hovered above $60 per barrel between 2006 and early 2009. This resulted in a current surplus of 15.7 percent of GDP in 2004, an improvement of 1.1 percentage points on the level recorded in 2003. By the year end 2005, excess crude oil account in Nigeria reached over 360 billion naira while oil production is about 1.2million barrels per day since 2006.

As the government of Nigeria was in the center stage of economic reform under the Nigerian economic empowerment and development strategy (NEEDS) and the IMF Policy Support Instrument (PSI) as well as the HIPC initiative, excess liquidity was curtailed and government maintained some level of fiscal prudence. Foreign direct investment and portfolio investment increased markedly especially after the consolidation exercise before the wind of global financial crisis blew in 2008. Thus, external reserve increased and boosted the confidence of business and consumers in 2005 and 2008. Gross external reserves grew considerably from $7.5 billion in 2003 to $17.0 billion at the end 2004, and could finance 18.7 months of imports. By 2006, reserve grew to 46.4 billion and reached 64.billion in 2008 before the steep fall to 43 billion in 2009 indicating its response to the global financial crisis.

The external debt profile of Nigeria which continued to expand during 1997-2004 arising from the deferment of payments on the principal and interest recapitalization, under the debt rescheduling framework, has long reversed. This is connected with the debt cancellation initiative offered by her creditors (Paris club and London club) in 2005. Generally, the current account balance of Nigeria improved tremendously after series of negative performances in the late 1980s and 1990s. The capital account balance recorded some positive results following the deregulation of the communication sector and the increased quantum of foreign direct investment and increased portfolio investment after the consolidation of banks in 2001 and 2005 respectively. Since the economic and financial reform undertaken in 1986, exchange rate reform became prominent. The floating exchange rate of the dirty type has been the hallmark of the Nigerian exchange rate system as a result of the favorable disposition of the central bank of Nigeria to use it as adjustment instrument.

In the first instance, the bank introduced the second tier foreign exchange market (SFEM) to provide foreign exchange for the secondary bidders and was later changed to the inter-bank foreign exchange market (IFEM). Evidently, the naira fluctuated considerably accompanied by increasing inflation rate. The naira depreciated on the average of 60 percent between 1998 and 2003, reaching over $1 to N136 in 2004 before it fell to N126 to a dollar in 2008 and has remained above N100 to the a US dollar. In terms of trade interaction, Nigeria trade less with other ECOWAS/WAMZ members as its main export goes to the European market and imports considerably from the United States of America and China. This accounts for the high but systemic terms of trade shock with other members of WAMZ.

2.3.5 Sierra Leone:

Macroeconomic Framework and Developments

Sierra Leone is a small open economy with a large number of farmers operating at the subsistent level. The country relies heavily on a high concentration of primary agricultural and mineral exports. The population is about 5.6 million, and political and economic crises have caused the country to suffer a great deal of economic mismanagement. The country has also implemented structural adjustment and institutional reforms to tackle its teething macroeconomic problem. However, Sierra Leone performance in the external sector shows substantial low level

of trade interaction with other counties especially, the WAMZ member countries. Again, macroeconomic problem of inflation and excessive budget deficit are reflections of poor economic management in the country.

Real Sector Developments and performance

The economy of Sierra Leone (S/L) in the late 1970s and 1980s witnessed a substantial economic decline due to the absence of credible economic policies to tackle the prevailing economic recession during the period. This was compounded by the outbreak of a brutal civil and political crisis in 1991 which lasted almost a decade. These events interrupted efforts in the early 1990s to reform the economy of S/L and by the second half of the 1990s the crises deepened. Thus, the critical political situation eroded the confidence of business and consumers, causing output to contrast by an average of 8.9 percent between 1997 and 1999. Prior to this period, output growth rose from negative 10 percent in 1995 to 5 percent in 1996 due to the little recovery associated with the toppled democratic election held in 1996. However, the military coup d'état of May 1997 reversed the trend as output dipped by 17 percent in 1997 and output growth worsen through out the remaining part of the 1990 decade.

At the beginning of the crisis, inflation rate rose by 109 percent and 102 percent in 1990 and 1991 respectively, and fell sharply to an average of 23 percent between 1992 and 1996. This was a direct response to policy consolidation effort before the war. Inflation rate reached 35 percent in 1995 and declined to 23.1 percent in 1996, a factor attributed to the fragile political stability of the democratic election.

Following years of decline, by the year end 2000, output growth rebounded to 3.8 percent, a corollary in the improvement of the security situation, when the political crisis ended. Consequently, the real GDP growth rate increased significantly, recording 17.9 and 27.5 percent in 2001 and 2002 respectively. However, the Sierra Leone macroeconomic stability remained fragile due to external and internal factors. The trend changed fairly as real GDP growth fell again to 7.2 percent in 2004 but with an average increase of 11.6 percent between 2000 and 2006 which was generally broad based. With some degree of stability in the system, business and consumers confidence was rekindled which impacted positively on the price level. By the year 2000 and 2002, inflation rate hovered around a single digit but dramatically rose to a double digit

above 15 percent in 2003 and 2004. This was largely caused by the negative effect of central bank financing of fiscal deficit and the rise in petroleum products prices as well delay in the donor's funds. The year on year inflation rate has remained in double digit through 2005 to date despite the increasing surveillance of the region to attain the policy target of the convergence council.

Fiscal Developments and Performance

Given the economic structure of Sierra Leone, its revenue generation relies heavily on tax, external grant from foreign donors and revenue from export of primary agricultural products which face pricing challenges in the international market. Perhaps, the civil crisis eroded government's capacity to generate revenue, amidst high tax rates and tax exemptions. Domestic revenue to GDP averaged 8.0 percent between 1997 and 1999. The domestic revenue to GDP was low as 6.8 percent towards the end of the political crisis in 1999. However, public expenditure systematically increased the same period financed through borrowing resulting to a contagious debt overhang, and accumulation of huge external and domestic debt arrears. A major development in the aftermath of the war in 1999 and beyond was the phenomenal increase in government's expenditure in rebuilding the war ravaged economy. Total public expenditure and net lending exploded during the period, averaging at 17.4 percent of GDP with a high of 21.0 percent of GDP in 1999 and current expenditure accounting for over 80 percent of total expenditure.

After an initial increase in 2000 from 11.4 percent of GDP to 13.0 percent of GDP in 2001, total domestic revenue hovered around 12.0 percent of GDP between 2002 and 2004. Overall, domestic revenue soared from 6.8 percent of GDP in 1999 to 11.6 percent of GDP in 2006, even though revenue effort declined between 2003 and 2006. Revenue effort averaged at 12.1 percent during 2000 and 2006, compared to 8.0 percent during 1997 and 1999. Total expenditure and net lending reached climax of 29.5 percent of GDP in 2001, but later fell, reaching 21.3 percent in 2006.

Though, revenue mobilization increased in nominal terms reflecting some improvements in commercial activities after the conflict, potential domestic revenue was compromised by excessive duty free concessions. The economy was unable to tap all resources owing to

manpower problems. Consequently, the fiscal balance (revenue and expenditure) deteriorated rapidly. Fiscal deficit excluding grants (on commitment basis) averaged 9.2 percent of GDP during the period 1996 to 1999, as 1999 recorded a deficit of 13.9 percent of GDP. The inclusion of grant narrowed deficit to a noticeable 6.3 percent of GDP after rising from 5.8 percent in 1996 and 8.5 percent in1999.

During the period 2000 and 2004, fiscal deficit remained significant, with the overall deficit including grants averaging 9.1 percent of GDP. From 14.1 percent of GDP in 2000, government deficit including grants was fairly moderated to 10 percent in 2001 and 8.6 percent average between 2002 and 2003. Despite the gradual fiscal consolidation and improvement, fiscal deficit to GDP in Sierra Leone remained largely constrained due to comparatively weak domestic revenue performance, high demand for social expenditure and wage agitations which undermined expenditure control mechanisms.

Evidently, between 1997 and 1999 total external debt stock was highly unsustainable at an average of 172.1 percent of GDP, with a debt stock of US$753.5 million (or 228.1 percent of GDP) as at the end of 1999 compared to a stock of US$421.4 million (or 112.9 percent of GDP) in 1997. Similarly, domestic debt stock as a percentage of GDP grew more than external debt during the review period from 6.3 percent in 1997 to 19.2 percent in 1999, with the debt stock amounting to Le231.6 billion in the later period. Broadly speaking, the fiscal balance over time indicates that Sierra Leone fiscal position has been very weak. Thus, it relies heavily on the central bank for financing its fiscal deficits.

Monetary Sector Developments and Performance

The Bank of Sierra Leone (BSL), established in 1964, is responsible for managing and controlling monetary policy with the primary goal of achieving price stability. The bank's monetary policy stance has been mixed with intermittent adjustments reflecting the changing macroeconomic environment. There are basically two paradigm shifts in terms of monetary management since the establishment of the bank of Sierra Leone. Prior to early 1990, the pursuance of monetary policy objectives was undertaken mainly through the use of direct instruments such as reserve requirements, special deposit requirements, selective/qualitative credit control and moral suasion.

Under this arrangement, growth of money supply and credit was highly limited through direct constraint on the growth of commercial banks balance sheets. Interest rates on government securities were administratively administered and the commercial banks were required to hold a minimum of 40 percent of their total deposits liabilities as reserve asset with the central bank. This was in addition to cash/deposits ratio of 12.0 percent. In order to control liquid assets, the banks were mandated not to keep above 20.percent of total reserve requirement in treasury bill holdings, while special deposit requirement was imposed on the commercial banks having excess liquidity as well as credit rationing to priority sectors as control measures.

In terms of performance, Sierra Leone witnessed poor economic performance during the 1980s and 1990s as the general economic environment was harsh externally and internally with stifle regulated policy. Thus, inflation increased rapidly, balance of payment deteriorated and economic growth shrank markedly. A large degree of inefficiency and misallocation of resources characterized the financial markets operations during this period.

In 1986, the IMF and World Bank supported policy reform package (SAP) led to the shift from directly regulated monetary policy framework to the indirect market-based approach. Thus, the Open Market Operation (OMO) was introduced as a major instrument of monetary policy management. Treasury bill auction was complemented by reserve requirements and discount window operation within a unified bank and non-bank market arrangement. To accompany this, the monetary sector reform was extended to include financial sector hence interest rate and exchange rate was liberalized and deregulated. Commercial banks deposit and lending rates were also deregulated with the aim of reducing the constraints on liquidity. In terms of the conduct of monetary policy, the primary objective of the bank is price stability and sustainable economic growth through which the target of monetary growth and credit served as the nominal anchor of monetary policy.

In general, the overall performance of the monetary sector indicates that the direct regulatory era influenced macroeconomic indicators. Money supply grew from 71.1 percent in 1985 to 88.4 percent in 1986 but declined to 64.0 and 56.9 percent in 1987 and 1988 respectively. The increase in money growth during this period was partly due to monetization of the huge government deficits, which led to rise in price inflation. During this period, inflation rate reached 178.7 percent in 1987 due to unsterilized excess liquidity. However, during the

period 1988 to 1989, inflation rate declined. It showed the positive effect of SAP. This was, however, not sustained as inflation rate recorded over 110.9 and 102 .7 percents in 1990 and 1991 when the market determined exchange rate system was introduced in 1990.

Between 1991 and 1993, the money market was deepened as treasury bill market witnessed a significant change again. The government introduced a treasury bearer bonds scheme as a borrowing instrument. While the treasury bearer bonds were issued monthly in the primary market, the bids for treasury bills were submitted in discount; those for treasury bearer bonds were submitted in specific interest rates. During the period 1991- 1998, money supply declined moderately. With an annual growth rate of 76.2 percent recorded in 1991, money supply growth fell to 33.2, 21.9 percents in 1992, 1993 reaching a low value of 8.8 percent in 1994. Despite the bank's effort to stem money growth in the economy, the growth rate of money had further risen from 19.6 percent to 47.1 percent in 1996 and 1997 and reached the average rate of 31.2 percent between 1997 and 2000 after an unstained decline in 1998 due to fiscal expansions to rebuild the war ravaged economy. Similarly, reserve money grew at an average of 39.0 percent.

External Sector Developments and Performance

The external sector of S/L economy is noted for the export of primary products and importation of finished goods. The general harsh economic recession witnessed in the late 1980s became unfavourable to countries with weak economic base. Thus, Sierra Leone's export declined. Though imports were fairly stable, exchange rate fluctuation deteriorated significantly impacting negatively on the current account and capital account balances. During this period, deficit current account and balance of payment were high and external debts began to accumulate. In the aftermath of the structural adjustment programme, exchange rate and trade systems were liberalized in the 1990s. Export growth plummeted to -64.2 and -32.0 percent in 1997 and 1998 respectively but recovered slightly with a growth of 8.3 percent in 1999. Import growth sagged to -56.1percent in 1997 and recovered moderately in 1998 before declining again to -16.9 percent in 1999. However, trade deficit narrowed considerably as it fell from US$165.66 million to US$73.06 million in 1999. The Leone exchange rate to US dollar depreciated apparently above 18.9 percent average between 1997 and 1999, and was more pronounced in 1998. Consequently, the gross external reserve grew sluggishly by less than 0.6 percent from US$38.48 million in 1996 to US$39.45 by the end of 1999. Since the end of the political and

civil crisis in 1999, the external sector had improved tremendously only between 2000 and 2007, especially in 2000, 2001 and 2004.

2.4 Trend Analysis of Selected Macroeconomic Variables.

Figure 2.3 below shows that fiscal deficit as a percentage of gross domestic product witnessed high level of volatility particularly in Ghana and Sierra Leone. Between 1982 and 1992, fiscal deficit rose by more than 15% on the average, in Nigeria and Sierra Leone. In 1994 and 1996, fiscal deficit went high in Gambia, a consequence of the fall in export revenue and war-induced expenditure while Ghana recorded moderate rate of deficit. However, fiscal deficit to GDP rose by more than 15% average in Sierra Leone during 2000 and 2006, while maintaining a persistent increase above 15% average since 2004 in Ghana. The cause of the growing fiscal imbalance in Ghana is due to the unsustainable spending incurred during the recent democratic election and the increasing effort to rehabilitate the dilapidated public corporations and utilities.

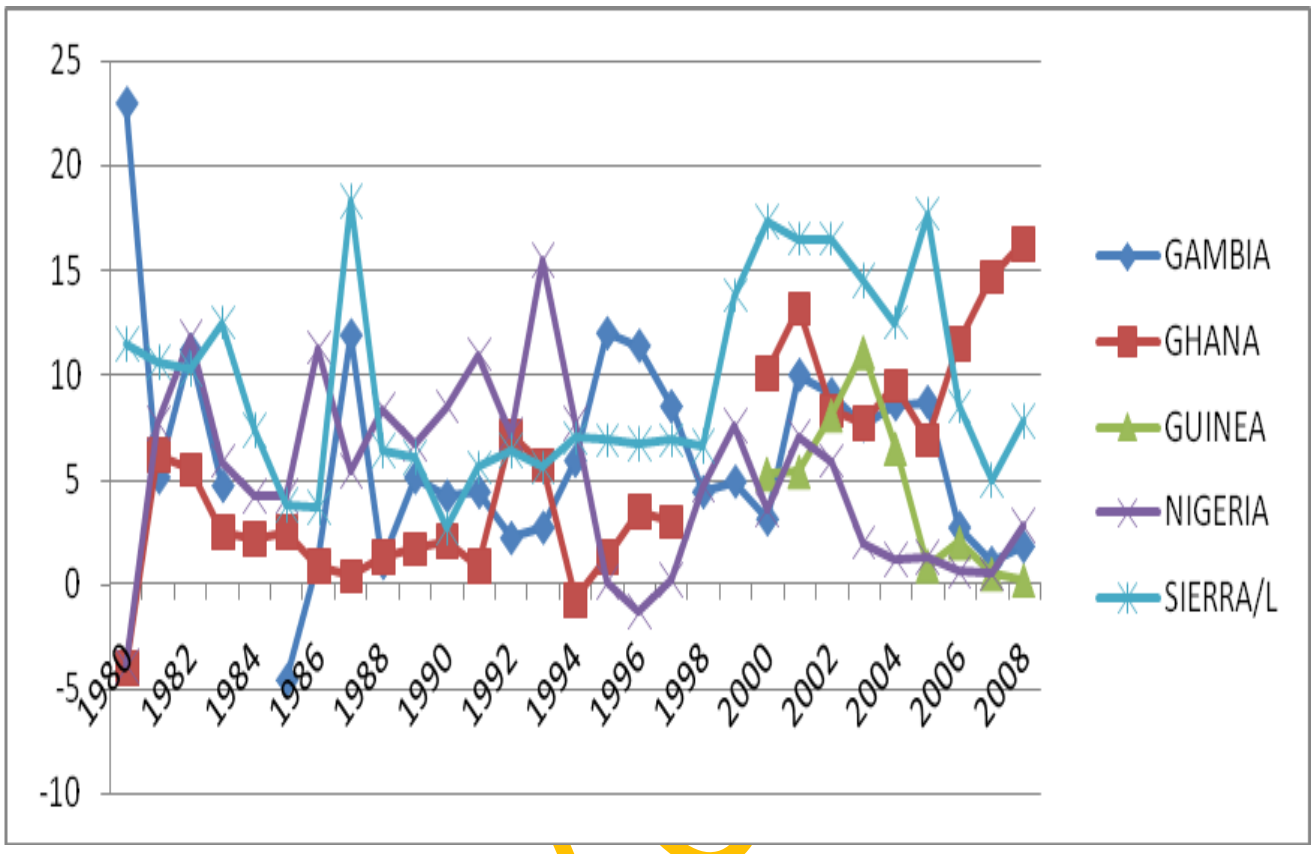

Figure2.3: Fiscal Deficit as a Percent GDP in WAMZ **Source: (IMF, 2009)**

The relationship between broad money growth and reserve money in Figure 4 below indicates strong positive correlation. While reserve money grew by 80%, broad money grew by almost 70% during the period 1986 and 1990 in Sierra Leone. Between 1996 and 1999 reserve money grew by over 90% despite the 22% growth rate of broad money supply in Ghana. However, the growth of broad money supply has outgrown reserve money in all the countries during 2005 and 2007 due to improvement in fiscal operations associated with policy surveillance across the zone.

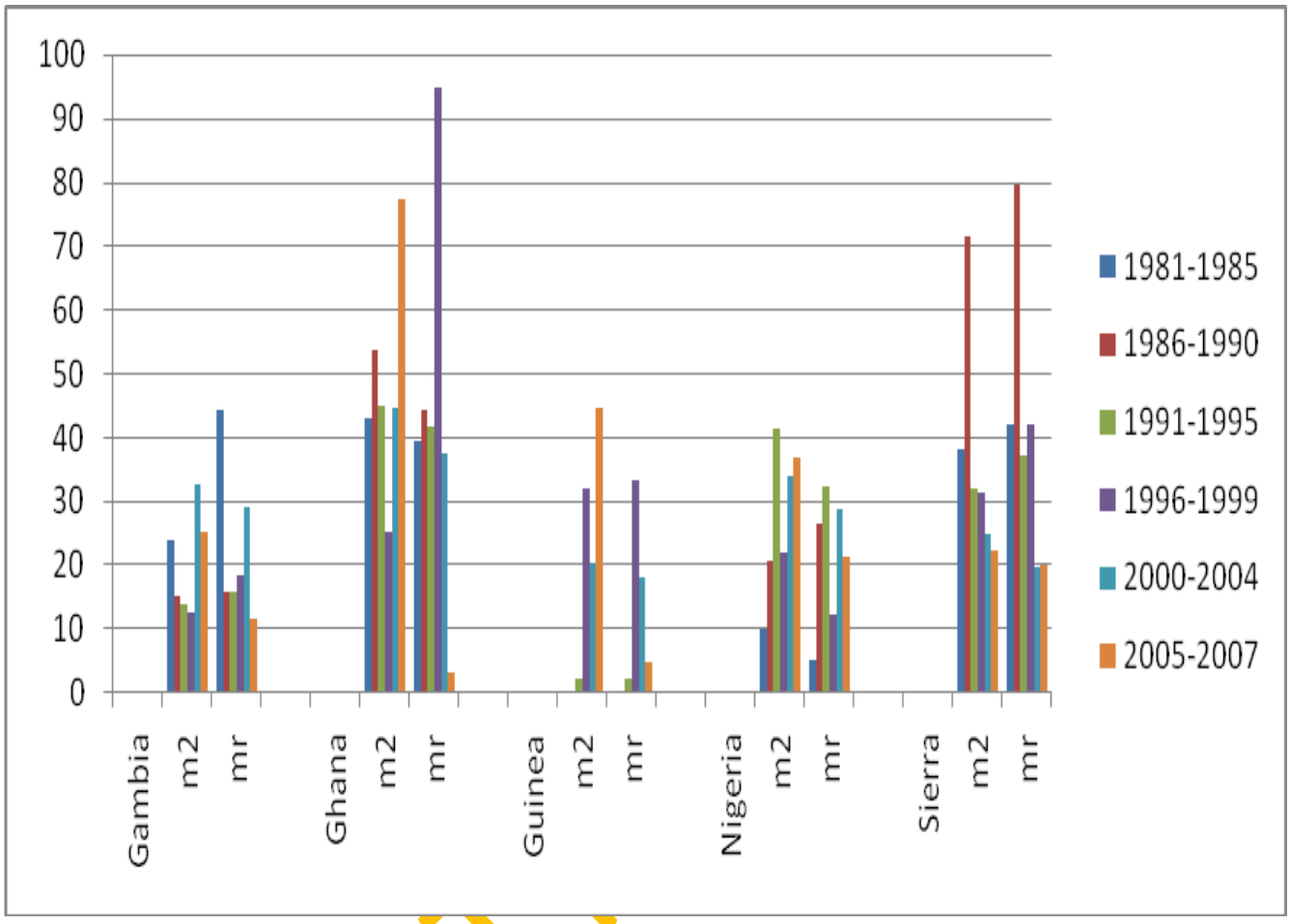

Fig 2.4: Broad Money Growth and Reserve Money in WAMZ **Source: (IMF, 2009)**

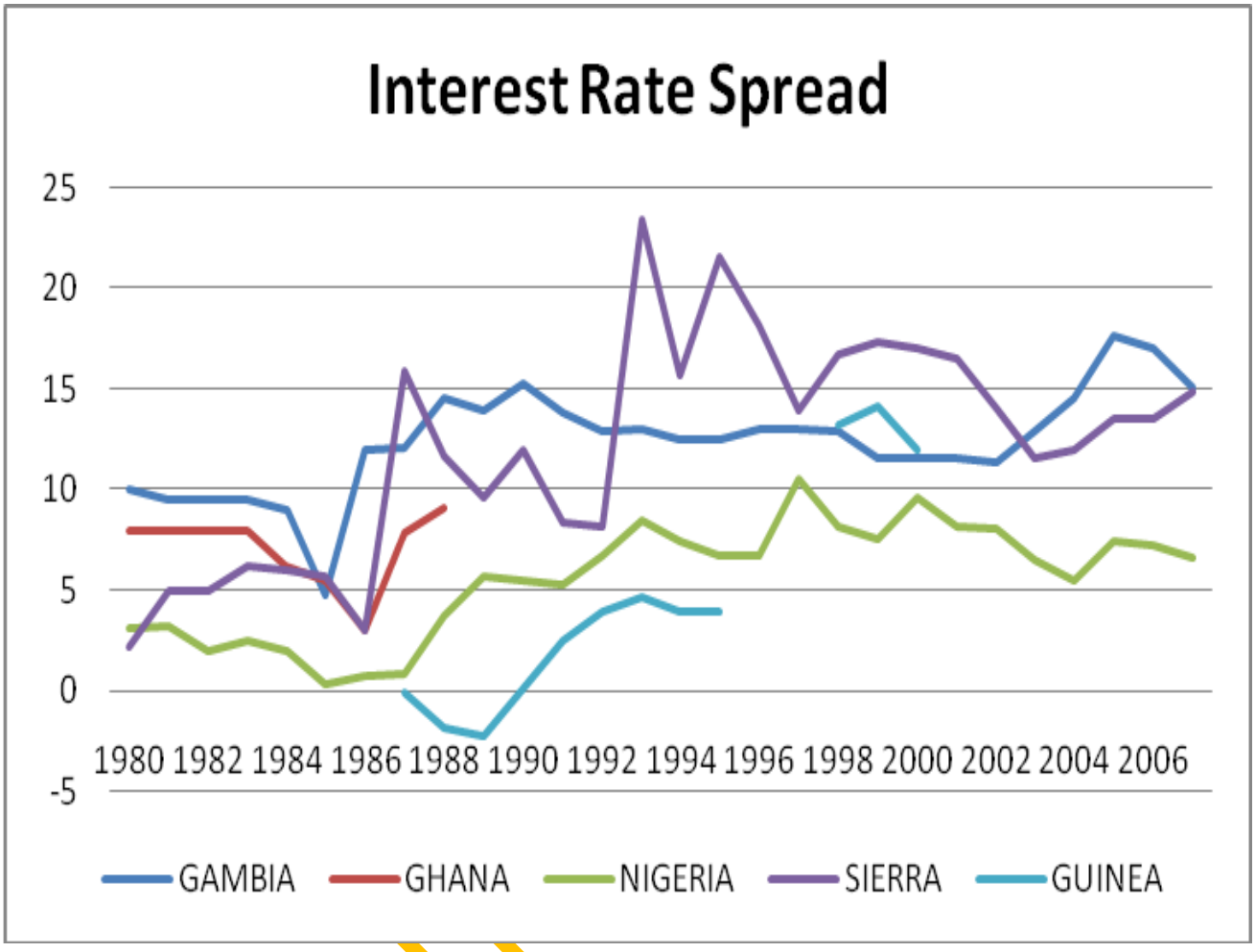

Fig 2.5: Interest Rate Spread in WAMZ **Source: (WDI 2008)**

In terms of external sector performance, the value of export grew from 6.6% to 6.8% in Ghana, 5.3 % to 10.2% in Nigeria and -3.4% to -7.6% in the Gambia during the period 1985-1995 and 1995-2006 respectively. Similarly, the value of imports declined from 9.0% to -0.6 in Gambia, 11.5% to 9.8% in Ghana and 8.2% to 1.9% in Nigeria during the same period. This suggests an improvement in the current account. This is a positive indices of trade integration among member states (WDI, 2008). However, the behaviour of interest rate spread as a measure of financial integration is mixed. The trend indicates high level convergence in Nigeria while other countries witnessed convergence in particular period and systematic divergence in other periods. This suggests that Nigeria financial system is more integrated into the world economy than other countries of WAMZ.

Table 2.2: Selected Macroeconomic Indicator of WAMZ Countries

Country	Real GDP growth rate		fiscal deficit/GDP		M2/GDP		Current/Acc Balance		inflation rate	
Years	1995-2000	2001-2006	1995-2000	2001-2006	1995-2000	2001-2006	1995-2000	2001-2006	1995-2000	2001-2006
The Gambia	3.9	4.7	-6.8	-7.65	27.0	37.7	-9.9	-16.6	2.8	8.2
Ghana	4.3	4.4	-2.6*	-9.25	20.4	26.32	-3.4	-10.6	33.6	16.1
Guinea	4.2	2.9		-5.6						19.7
Nigeria	2.8	5.5	2.5	0.6	16.15	27.8	-2.2	2.7	23.3	13.8
Sierra Leone	-4.2	12.5	-9.7	-14.6	12.15	21.7	-12.3	13.5	21.8	7.9

Source: Author's calculation from *International Financial Statistics* (2007) and *WAMI* (2008)

CHAPTER THREE

LITERATURE REVIEW

.....A critical question for Africa is whether the creation of regional central banks can be a vehicle for solving credibility problems that bedevil existing central banks.

(Masson and Pattillo, 2004)

The chapter contains a critical review of the bourgeoning literature on the costs and benefits of joining a monetary union. Attempt has been made in discussing the subject matter in threefold namely; the theoretical, methodological and empirical literature. It also discussed some key elements of costs and benefits of monetary integration with a view to identify the gaps in knowledge and to extend the frontier of the subject matter.

3.1. Theoretical Issues and Review

Theory and evidence have established the existence of monetary union in what looks unthinkable politically among policymakers and economists. Monetary union is a concept where two or more countries decide to give up their independent monetary policy framework to adopt common monetary policy architecture, common central bank and a single currency. It is often regarded as the last stage of/or step towards economic and monetary integration. Economic integration is a mechanism where group of countries adopt common national economic policies including tariff and non-tariff measures. The original debate on monetary union stems from the unassuming instability witnessed in the international monetary system which the prevailing flexible exchange rate regime could not curtail. Major emphasis has been that multiple currencies may be responsible for the speculative attacks on the exchange rates. Monetary unification, could in principle, serve as an alternative measure to address such disequilibrium.

In the literature on monetary union, there are basically two issues that are ultimately critical to policymakers and economists. These are the costs of abandoning independent monetary policy autonomy and the benefits of forming a monetary union. Both considerations have been the focus of researchers of monetary integration given their economic and political dimensions and implications. However, the focus of this study is principally directed towards the dialectical economic analysis of the costs and benefits of monetary union in WAMZ.

3.1.1 Costs of Monetary Union

Literature on monetary union shows that there are large costs associated with joining monetary unions. The decision to form a monetary union can come with a lot of challenges ranging from the loss of independent monetary policy and exchange rate as an adjustment instrument to other constraints such as administrative and legal costs of introducing new money, the psychological problems of the change of numerical valuations and other associated negative externalities (De Grauwe and Mongelli, 2005). Apart from loss of monetary policy sovereignty, the other constraints may be critically addressed when the process of economic integration is deeply rooted on a proper institutional foundation and sequencing. These costs could be minimized if there are mechanisms of educating and explaining the numerical framework of the new currency in relation to the old currency among economic agents in the integrating countries.

However, the costs of abandoning independent monetary policies are quite ambiguous. The menu of policy instruments under the direct control of national central banks narrow down once independent monetary policy is given up. Thus, monetary union can reduce the scope of national monetary policy and autonomous instruments needed for domestic adjustments. This suggests why it is often regarded as macroeconomic cost (Mongelli, 2002). Instructively, the associated loss of monetary policy autonomy has been linked to the characteristic nature of the countries forming the union theoretically (Ricci, 2008). These characteristics are embedded in the criteria developed by Mundell (1961) known as the Optimum Currency Area (OCA). Such conditions provide basis for analyzing the implications of the macroeconomic cost and competing paradigm of factors that could mitigate such adverse costs. The costs of monetary unification have also received further expositions within the domain of the new optimum currency area theory given other possible economic and structural characterizations associated with a currency area. These theories are discussed below.

3.1.1.1 Optimum Currency Area Theory

The optimum currency area (OCA) represents a geographical space that would maximize economic efficiency if the whole region is economically integrated (Nnanna, *et al.* 2007). The traditional optimum currency area emerged from the pioneering seminal contributions of Mundell (1961) and extended by McKinnon (1963), Kenen (1969) and Ingram (1973). The

theory espouses the conditions under which a region or group of countries qualify as an optimum currency area as basis for assessing the expected net-benefit of monetary union. An optimum currency area is defined as a group of countries with economies closely linked by trade in goods and services and by factor mobility (Krugman and Obstfeld, 2000:629). Thus, such group of countries or region may have similar economic structure and symmetric shocks simultaneously. In such arrangement, a common currency may become optimal for the entire region. The optimality of this theory is viewed as a case where the costs of relinquishing exchange rate as an internal instrument of adjustment are outweighed by the benefits of adopting a single currency or a fixed exchange rate regime (Ricci, 2008: 2).

The theoretical foundation of the optimum currency area (OCA) stems from the recognition that foreign trade imposes special trading costs (such as trading and monetary trade costs) that are not encountered in domestic trading. Thus, the monetary-trade costs as a result of the use of multiple currencies in inter and intra-regional trade can be given up if countries join or form a monetary union. Another important theoretical thrust of the OCA is derived from the fluctuations and instabilities of the flexible exchange rate and transaction costs (transport and monetary costs) that impinge on inter and intra-regional trade. In this connection, the dead weight loss due to high risk premium built on real interest rate and uncertainties in exchange rate would be lost to monetary union and thus, enhance welfare through greater inter and intra-regional trade between and among members of a monetary union (Kronberger, 2004).

Mundell (1961) proposed a simple idea to determine whether it can be costly or beneficial for countries in a region to create a common monetary area. He argued that fixed exchange rate among countries of a region could produce better results than the flexible exchange rate if they posses common characteristics. He maintained that when factor (labour) mobility that permits large fiscal transfer is present across a region, as well as the existence of flexible wage and prices among countries, asymmetric shocks would reduce in that region. Accordingly, countries could afford to lose their exchange rates as a tool of adjustment because exchange rate plays a passive role when a region is faced with symmetric shocks. McKinnon (1963) asserts that the more open the economy, the less the effectiveness of exchange rate as an adjustment instrument for correcting external imbalances. According to his reasoning, open economy bears close link with the law of Purchasing Power Parity (PPP), indicating that exchange rate would affect most prices

the same way and may not be able to generate the changes sought in relative prices. Kenen (1969) argued that the more diversified the production structure of a country, the less the likelihood of asymmetric shocks and the less important it is to depend on exchange rate in adjustments during recession period. The major theoretical challenge has been to reconcile these criteria with the associated costs of relinquishing independent monetary policy sovereignty.

Vaubel (1978) sought to provide the linkages between these three criteria and real exchange rate. In his view, if labour is mobile, unemployment within the monetary union will be eliminated through labour migration to other areas in the union. Thus, fewer attempts will be made to change the real wage rate through exchange rate depreciation. Second, if trade between members of a monetary union is highly diversified, the law of large numbers reduces the probability and the size of changes in each country's terms of trade. Hence, countries whose external transactions are highly diversified will experience only small real exchange rate changes. Third, the openness criterion concerns macroeconomic efficiency of nominal exchange rate changes, for the openness of the economy is, if at all, negatively correlated with stock of exchange rate illusion available for real adjustment through nominal exchange rate changes. Observed real exchange rate changes tend to be smaller, the more open the potential member economies are in relation to each other. A major shortcoming with this analogy lies in the author's inability to replicate the assumed relationship in a robust and coherent theoretical relationship to establish why countries could give up their national currency rather concentrated on exchange rate variability, a variable that is assigned a passive role in the OCA view (Ogunkola 2005). It seems that fluctuation in exchange rate may not be a sufficient consideration for a country to give up independent monetary sovereignty given other overriding objectives (see, Lucas, 2003).

Generally, the emphasis is that the optimum currency area criteria would lead to symmetric and synchronous business cycles and shocks among the countries. The contention of the OCA implies that a region with substantial asymmetric shock may be difficult to sustain a monetary union. A nexus drawn from this argument indicates that the optimum currency area theory and the criteria espoused by various authors suggest that asymmetric shocks do not make monetary union beneficial. Asymmetric shocks are those shocks that affect members in a non-synchronous manner (Krugman and Obstfeld, 2005). Differences in economic structures are likely to account for such asymmetries (Bergman, 1999). According to Kenen (2004), asymmetries often result

due to non-correlation of business cycles from trade divergences, and domestic factors resulting from productivity and supply idiosyncrasies. These asymmetries also include fiscal policy distortion (Debrun, Masson and Pattillo, 2005). As Coleman (1999) points out, this could be the reason why high degree of correlation of business cycles is by many seen as a necessary condition for entering a monetary union. Intuitively, when a group of countries satisfy these criteria, they constitute an optimum currency area (OCA). Hence, exchange rate as an adjustment tool will become ineffective and unnecessary. Whether it is appropriate is a question for empirical analysis, although it seems logical that a monetary union might enhance the harmonization of business cycles in a region (Zika, 2006).

A critical evaluation of the OCA argument presupposes that asymmetric shocks weaken the case for common currency among potential partners. This may be costly as members of monetary union lose the rights of monetary autonomy needed in the manipulation of the value of their currencies as tools of adjustment as well as for the conduct of independent monetary policies. The proponents of OCA, therefore, argue that the net-gains of joining a monetary union are contingent upon the nature of their shocks symmetries and perhaps, make an area qualify as an optimum currency area. The major caveats with this theory lie in its static nature. The OCA theory does not believe that such criteria could be achieved after monetary union has been formed for regions that do not satisfy these criteria ex ante. It is designed in the form of "one cap fit all". These have raised series of thought provoking issues in the analysis of costs of adopting monetary union in the literature (Frankel and Rose, 1998; Mongelli, 2002; Kronberger, 2004; De Grauwe and Mongelli, 2005 and Zika, 2006).

Despite the strong insights provided by the optimum currency area theory, it appears far from providing the analytical apparatus needed in the analysis of the costs of joining a monetary union. There appear some measures of inconsistency and inconclusiveness in demonstrating a unifying framework of the OCA criteria as a basis to justify why potential members of a currency union should give up their monetary policy sovereignty (Mongelli, 2002 and Ricci, 2008). Attempts to provide clearer insights in this direction ushered the new optimum currency area theory.

3.1.1.2 New Optimum Currency Area Theory

The New Optimum Currency Area (NOCA) theoretical framework presents a departure and advancement of the net-benefit of a monetary union from the traditional OCA. The foundation of the NOCA is derived from the endogeneity of the optimum currency area criteria pioneered by (Frankel and Rose, 1998 and Rose, 2000), and the recent advances in the new open macroeconomic theory (Obstfeld and Rogoff, 1995; Woodford, 2003; Gali, 2008; and Corselti, 2008). The endogeneity of the optimum currency area theory argues that the shocks-founded criteria required by the OCA to form a common currency can be achieved ex post, if not ex ante. The theoretical thrust is that region that does not constitute an OCA may become one after forming a monetary union. The economic intuition is that heterogeneity of economic structures reduces the more countries become integrated in trade (openness). Frankel and Rose (1998) emphasized that economic and monetary integration increases the trade linkage between two countries thereby reducing asymmetric shocks between them as argued by the OCA. Through this mechanism, increased trade resulting from economic and monetary integration could lead to synchronous business cycles that weaken asymmetric shocks and makes a monetary union less costly and more beneficial. The persuasive argument is that monetary union leads to increased intra-regional trade, and increased trade results in the greater correlation of business activity among the integrating partners (Zika, 2006:10).

Another variant of this theory has drawn a critical interface between the endogeneity criteria and policy delegation along the path of the optimum currency area theory (Beetsma and Bovenberg, 1998 and 2000; Masson and Pattillo, 2004; Debrun, Masson and Pattillo, 2005; Kronberger, 2004, and Zika, 2006). The conceptual view is that delegating monetary policy to a regional body helps to discipline policymakers, enhances the attainment of a stable and competitive economy, and perhaps, promotes intra-regional trade (Collier, 1991 and O'Connell, 1998). Debrun, Masson and Pattillo (2005) emphasize that monetary union may be surrogate of policy delegation to conservative central bankers when policymakers face time inconsistency problems. This was the rationale for the establishment of the European economic and monetary unification and the success has stimulated interest and attraction for other regions of the world (Masson and Pattillo, 2004). Such arrangement induces efficient policy coordination mechanism among policymakers that enhances better interaction between fiscal and monetary policies.

According to the time inconsistency literature, the incentives faced by policymakers to renege from policy targets is fully addressed through a monetary union with policy rule (Dixit and Lambertini, 2001). Beetsma and Bovenberg (1998) contend that monetary union deals with time inconsistency problem of monetary policy by restraining undisciplined policymakers. They argue that under a fiscal policy leadership arrangement, monetary union helps to control unguided government spending which results low inflation. The extended view differs from the traditional optimum currency area in their concerns with the issue of desirability and design of monetary union. Thus, asymmetric shocks considered as a trade-off to trade creation would be reduced, as intra-regional trade increases due to monetary unification, hence, the optimum currency area criteria should be endogenised (Frankel and Rose 1998). Furthermore, the phenomenal effects of globalization and international monetary dependence spillover effects suggested by Hamanda (1985) necessitate a potent and consistent monetary policy adjustment framework especially, for weak countries common economic relationship with bigger economies. The reason is to restrain bigger-thy neighbour politics.

Despite these glaring contributions, the NOCA theory could not directly account for the costs associated with the loss of autonomous policy instruments as well as other benefits expected in joining a monetary union. It is also difficult to conclude whether any set of partnering countries could form a currency union and just wait for the deeper integration to occur almost automatically and inevitably reap net-benefits from a single currency (Mongelli, 2005:6).

Therefore, given the fundamental insights in understanding the optimality of a currency area, it is imperative to undertake a theoretical assessment of the costs elements of joining a monetary union so as to provide quantitative mechanism for such an informed analysis. To organize this argument and provide a mechanism that could provide robust analytical guide, the costs of monetary integration is discussed within three identified thematic fronts namely; asymmetric shock, loss of independent policy instrument and fiscal policy distortion.

3.1.1.3 Asymmetric Shock Costs Effects

In the literature on monetary union, two main but competing theories have been offered to provide theoretical underpinnings on the implications of asymmetric shocks. They are the optimum currency area theory and the endogenous optimum currency area theory. The optimum currency area argues that when member countries of a currency area face shocks asymmetrically, such a monetary union or currency area may be very costly to sustain. Asymmetric shock is critical because buying into a monetary union neutralizes the effectiveness of exchange rate as a tool of domestic adjustments. However, Ricci (2008) points that exchange rate between two areas is an effective instrument of short-run adjustment if the following conditions hold: (1) the two areas face asymmetric shocks, so that an adjustment of the relative price of the goods produced in the two areas is required; (2) domestic prices are not fully flexible, hence prices do not adjust immediately to shocks; (3) pass-through is not large, so that a relative price change due to an exchange rate change is not immediately neutralized by domestic price movements; and (4) if adjustment through the exchange rate is less costly than through other possible mechanisms of adjustment. Policy response to shocks must require in a critical manner, the kind and source of shocks otherwise may be mistaken (see, Kronberger, 2004).

Prominent sources of generating asymmetric shocks covers wide spectrum in the literature of optimum currency area. These include real exchange rate variability among members of a region, variation in the consumer price index, variation in the terms of trade as well as output variations within and among members of the currency area. Bayoumi and Eichengreen, (1992) show that asymmetries in different form they appear may lead to fluctuations in output hence, output variation determines the nature of shocks to a region. A striking revelation of the above position is that asymmetries in output fluctuation may result from the changes in the terms of trade through changes in the real effective exchange rates. Upholding the above views, Masson and Pattillo (2001) add that asymmetric shocks in output arise from substantial diversity in the primary product exports of a region which often results in the not well correlation of shocks among members of a region particularly the countries of WAMZ.

There is also an emerging view that asymmetry resulting from fiscal policy distortion makes the decision to join a monetary union unattractive (Debrun, Masson and Pattillo, 2005). Broadly, this asymmetry and terms of trade variation have been regarded as possible factors that affect

output especially, in developing countries of WAMZ with weak institutional framework. Debrun, Masson and Pattillo (2005) traced the asymmetric shocks to output as;

$$y_i = c(\pi_i - \pi_i^e - \tau_i) - \sum_{k \neq i, k=1}^{n} \theta_{i,k} c(\pi_k - \pi_k^e) + \varepsilon_{i,} \qquad i = 1, ..., n. \qquad 3.1$$

Where, the parameters $\theta_{i,k}$ capture the marginal externality effects of the monetary policy action in country k on output in country i. The ε_i represents the effect of the country-specific terms-of-trade shocks, with a zero-mean, non-autocorrelation and a finite variance $\sigma^2_{\varepsilon_i}$. The asymmetries arising from inflationary distortions and tax also affect output as captured by c. The log-linear specification reflects deviation from an arbitrary steady state. An implication directly deduced from this is that if there are differences in government financing needs, the incentive to participate in a monetary union will differ across countries (see section 3.2.1.3 for a broader discussion). Big spenders will benefit from the extra discipline afforded by the regional central bank, which partly offsets the inflation bias of their national banks, while small spenders will incur additional losses stemming from excessive demands of the big spenders for monetary financing (Masson and Pattillo, 2004). Excessive and continuous fiscal deficit threatens the sustainability of any monetary union. This is the concern in the European monetary integration about the mounting fiscal deficit of Greece with the big question of who will bail Greece or the European central bank from such imbalance. Yet, monetary union can serve as an effective instrument and agency of restraint for countries with history of fiscal deficit (Collier, 1991). Overall, asymmetries in the form of non-correlation of business cycles from trade divergences, and domestic factors resulting from productivity and supply idiosyncrasies in output makes a region not only suitable for a currency area but very costly to sustain.

On the other hand, the endogenous optimum currency area theorists noted that asymmetric shocks may not be as costly as exemplified by the OCA (Frankel and Rose, 1998 and De Grauwe and Mongelli, 2005). They contend that the process of economic and monetary integration affects the symmetry of output fluctuation within a region through diverse channels. According to Frankel and Rose (1998), the removal of trade barriers raises trade, allows demand shocks to be more easily spread across the trading partners, and leads to more correlated business cycles. Knowledge and technological spillovers will also increase with economic integration and

enhance symmetry of output fluctuation (De Grauwe and Mongelli, 2005). From a theoretical viewpoint, closer international trade could result in either tighter or looser correlations of national business cycles. Cycles could, in principle, become more idiosyncratic. Closer trade ties could result in countries becoming more specialized in the goods in which they have comparative advantage. Broadly, whether a region faces shocks asymmetrically ex ante, monetary integration would increase trade and increased trade integration reduces asymmetric shocks and more correlation of business cycles. Thus, the anticipated costs associated with asymmetries may appear inconsequential.

Frankel and Rose (1998) developed a framework showing the link between trade intensity and business cycles. The intuition is that asymmetric shock is generated from output variation across countries, hence, changes in output is expressed as;

$$\Delta y_t = \sum_i a_i u_{i,t} + v_t + g \qquad 3.2$$

Where; Δy_t represents the growth rate of real output for the domestic country at time t, $u_{i,t}$ is the sector-specific deviation of the growth rate of output in sector i at time t from the country's average growth rate at time t, v_t; a_i is the weight of sector i total output $(\sum_i a_i = 1)$; and g is the trend rate of output growth for the country. The analogue for the foreign country is;

$$\Delta y_t^* = \sum_i a_i^* u_{i,t} + v_i^* + g^* \qquad 3.3$$

We assume that $\{u_{it}\}$ are distributed independently across both sectors and time of each other, with sectoral variance a_i. We further assume that the $\{v_t\}$ are distributed independently over time, independent of the sector-specific shocks. For simplicity, we also abstract from trend effects in the analysis which follows, though we return to the issue below.

The cross-country covariance of output is derived as;

$$Cov(\Delta y_t, \Delta y_t^*) = Cov(\sum_i a_i u_{i,t}, \sum_i a_i^* u_{i,t}) + Cov(v_t, v_t^*)$$

$$= \sum_i a_i a_i^* \sigma_i^2 + \sigma_{v,v^*} \qquad 3.4$$

Where σ_{v,v^*} in equation 3.4, capture the covariance between the country-specific aggregate shocks. Thus, the correlation coefficient estimate, which is the covariance adjusted for the volatility of aggregate income is then used to determine the extent of trade integration. The degree to which business cycles are correlated internationally rise or fall depends on how this covariance changes with increased integration. According to Frankel and Rose (1998), there are a number of potentially important channels that transmits this impulse. The spill-over of aggregate demand shocks will tend to raise the covariance, since e.g., an increase in public or private spending in one country tends to raise demand for both foreign and domestic output, especially if increased integration leads to more coordinated policy shocks. This may not be the only channel. The presence of greater trade integration may also induce a more rapid spread of productivity shocks, further raising the covariance (Coe and Helpman, 1995). It seems to us that closer international integration tends to raise the covariance of country-specific demand shocks and aggregate productivity shocks, thus increasing the international coherence of business cycles.

On the other hand, integration may tend to raise the degree of industrial specialization, leading to more asynchronous business cycles. The importance of this effect depends on the degree of specialization induced by integration, which may not be large if most trade is intra-industry rather than inter-industry. And the net effect on business cycle coherence depends on the relative variances of aggregate and industry-specific shocks. If the former are larger than the latter then we would expect closer trade integration to result in more synchronized business cycles. But, the critical issue is that a region with asymmetric shocks could become more symmetric if shocks are endogenised through the process of economic and monetary unification.

From the above theoretical and analytical discussion, there are two main gaps in the literature. First, it is evident that asymmetric shock appears to be an important element of costs of joining a monetary union. However, it is suggestive that the theoretical foundation implies shocks to be based on the criteria of optimum currency area and not as a prime cost of relinquishing independent monetary autonomy. The OCA framework is designed in the form of 'one cap fits all'. The validity of this argument is anchored on the endogenity theory which implies that monetary union may not be costly even in the presence of asymmetric shocks (De

Grauwe and Mongelli, 2005). Second, the various sources of shocks seem to be specific to different regions in relation to their economic structures and fundamentals.

3.1.1.4 Loss of Independent Monetary Policy

Theoretically, the loss of independent monetary policy associated with monetary unification is primed to the optimum currency area theory. Forming a currency area with a group of partner countries entails the loss of direct control over the national monetary policy and the exchange rate. This entails forsaking expenditure switching policies (Mongelli, 2002). Member countries of a monetary union lose exchange rate and seigniorage as instrument of adjustment and source of revenue respectively. The theoretical underpinning of OCA, however, suggests that the cost of exchange rate as an adjustment instrument tool may not be highly consequential if perfect mobility of factors exist in the region to provide alternative short-run adjustments to real domestic macroeconomic shocks in inflation and unemployment (Mundell, 1961). But, exchange rate may be an important critical tool of adjustments for economies with real and monetary shocks character in a monetary union (Ricci, 2008). As pointed by Kronberger (2004), views on the functions of exchange rate in the OCA approach, however, are sometimes mistaken. He argues that since productivity differences affect exchange rate, countries with considerable productivity growth difference joining a monetary or an exchange rate union like WAMZ might face costs if they relinquish the exchange rate as an adjustment instrument.

Nonetheless, the theoretical consensus about the effectiveness of exchange rate as a tool of adjustment in monetary union remains contestable with two opposing views in the literature. Arguments in its favour, state that exchange rates are indispensable tools of adjustment particularly under the flexible exchange rate system. For instance, if a country is faced with recession and asymmetric shocks, devaluation of its currency could be used to correct the problem of competiveness and balance of payment disequilibrium (Kronberger, 2004 and Ricci, 2008). The take of this view is that exchange rate is a costly instrument to lose under a monetary union. The opposing views, however, emphasize that exchange rate instability is itself the source of asymmetries in many emerging and developing economies (Rose, 2000 and Corselti, 2008). The costs from having no nominal exchange rate for countries joining EMU is likely to be low because movements in exchange rates are dominated by monetary and financial shocks preventing the exchange rate from performing its macroeconomic stabilization function

(Mongelli, 2002:16). Thus, the cost of losing exchange rate is not only inconclusive but more importantly discussed in relation to shocks adjustment since it bears a direct link with the characteristic features of the regional economies deciding to give it up.

On the other hand, the macroeconomic cost associated with the loss of monetary policy sovereignty appears to exhibit more theoretical consensus in the literature. Monetary union imposes constraints in manipulating autonomous policy instrument (seigniorage and domestic interest rate) to achieve overriding broader macroeconomic objectives (Zika, 2006). Seigniorage is an important source of revenue for most governments particularly WAMZ nations. Kronberger, (2004) notes that seigniorage is the main source of generating income for most countries with weak tax base and undeveloped financial markets while Debrun, *et al*. (2005) observe that seigniorage is created in WAMZ/ECOWAS countries to finance budget deficit which are most often inflationary in monetary economics parlance. The implication is that countries' entering into a monetary union lose these alternative financing instruments as critical policy handle. Therefore, countries need to evaluate the cost of losing their monetary policy financing mechanism against the benefits of joining the monetary union.

Arguably, the theoretical exposition of the loss of monetary policy autonomy as a prime cost to monetary unification within the optimum currency area framework is well appreciated in terms of the nature of interaction between the monetary and fiscal policy authorities. Hefeker (2008) argues that seigniorage revenue or deliberate money creation by the monetary authority often results from the spillover of the fiscal policy authority vis-à-vis debt instrument (Easterly, 1999 and Dixit and Lambertini, 2001). It is simply defined as the income/revenue generated by the government through the creation of base money in the economy. Following Visser (2005) seigniorage revenue can be expressed as;

$$s = \frac{\dot{M}_t}{P_t} \qquad 3.5$$

Equation 3.5 defines seigniorage as equal to monetary base. Transforming the equation by multiplying it by M_{t-1} / M_{t-1} yields;

$$s = \left(\frac{\dot{M}_t}{M_t}\right)\frac{M_t}{P_t} = \frac{M_t - M_{t-1}}{M_{t-1}} \cdot \frac{M_{t-1}}{P_t} \qquad 3.6$$

$$s = \left(\frac{\dot{M}_t}{M_t}\right)\frac{M_t}{P_t} = \frac{M_t - M_{t-1}}{M_{t-1}} \cdot \frac{M_{t-1}}{P_t} = \theta m_t \qquad 3.7$$

Where the first term in bracket is the growth rate of nominal money and M_{t-1}/P_t is the real money balances held by the public. Expanding the third term in equation 3.7 and multiplying it by $(P_t P_{t-1})/(P_t P_{t-1})$ yields the total seigniorage revenue into inflation tax and real balance component.

$$s = \theta m_t + \pi m_t \qquad 3.8$$

Equation 3.8 is defined as seigniorage, where the first term on the right-hand side is defined as real balance component of seigniorage while the second term represents the inflation tax. In the steady state, where money demand and money supply are equal, seigniorage revenue equals the inflationary tax. Hence, the growth rate of money stock θ is assumed to be constant.

$$s = \pi m_t \equiv \theta = \pi^e = \pi_t \qquad 3.9$$

The above theoretical framework indicates that the revenue generated by creating new base money implies inflation tax. However, from the perspective of monetary union, seigniorage emanates from the cha nge in real money balances due to the liability created by the central bank. The validity of this, according to Blanchard and Fischer (1989) and Mankiw (1987), is to achieve two objectives. First is to finance fiscal deficit as a prominent determinant of seigniorage among other rationales in Africa (Easterly, 1999 and Debrun, Masson and Pattillo, 2005). Second, it is to reduce welfare loss of inflation. The theoretical link between seigniorage revenue and fiscal deficit is clearly demonstrated in the next section. Evidently, there appears to be some interesting gaps in the various views on the loss of independent monetary policy as a cost to monetary unification. It is clear that despite the degree to which the policy instruments may be impotent, their relevance cannot be undermined. It seems logical to conclude, however, that the optimum currency area does not portend a generic theoretical construct for such analysis given its restrictions to exchange rate.

3.1.1.5 Fiscal Policy Distortion/Financing

Mainstream economic analysis of the costs elements of joining a monetary union along the optimum currency area have been extended to fiscal policy issues. A novel from recent theoretical views on the optimality of a common currency for group of countries has drawn a link between fiscal policy distortion with the costs of joining a monetary union (Mongelli, 2002; Masson and Pattillo, 2004; Debrun, *et al*. 2005; Zika, 2006 and Hefeker, 2008). The major issue is that when a member country of the union or potential partner witnesses fiscal deficit, other members of the union are expected to provide support (fiscal transfer) mechanism otherwise the entire members of the union may suffer such shock. Thus, the decision to join a monetary union is often influenced by the size and nature of the spending pattern of potential members (Masson and Pattillo, 2002 and Corselti, 2008). The idea is that the ability to use certain policy instruments (trade and monetary policy) against other countries or members may be lost to monetary union since countries may be under obligation to discard counter-cyclical policy strategies against each other in the union protocols.

The theoretical thrust of this cost draws largely from possible asymmetries in fiscal policy environment among potential partners of a monetary union. Differences in fiscal policy distortion affect incentives for countries to join a monetary union, and the willingness of the existing members to accept new entrant (Debrun, Masson and Pattillo, 2005). Fiscal policy distortion arises from the financing of fiscal deficit due in part to either short falls in the stream of revenue and/or excess spending driven from policy institutional weaknesses and political games among politicians. In open macroeconomics, fiscal policy distortion is one of the main sources of the time inconsistency problem of monetary policy (Kydland and Prescott, 1977 and Barro and Gordon 1983). Within the domain of optimum currency area literature, Debrun, *et al*. (2005) showed that total government expenditure is subject to seigniorage revenue (inflation tax), tax revenue less the costs associated with tax management and administrative inefficiencies.

$$g_i = \mu\pi_i + \tau_i - \delta_i \qquad i = 1,...,n \qquad 3.10$$

Where g_i and τ_i are the ratios of socially beneficial government spending and fiscal revenues to GDP, respectively and μ is the inflation tax base. The fixed parameter δ_i accounts for country-specific inefficiencies affecting fiscal policy design peculiar to West African sub-region.

Equation 3.10 implies that government expenditure depends on inflation tax and tax revenue less loses on tax collection inefficiencies. The reliance on inflation tax by independent central banks is presumed to provide a wedge of alternative financing instrument in order to sustain the primary balance for countries with poor fiscal policy mechanisms. The theoretical implication of equation 3.2.1.3.1 is unambiguous in the decision to join a monetary union since the power to create money for financing is completely not tenable for participating national central banks.

The thrust of this view stems from two channels. The first is that fiscal policy distortion might be an indication of poor macroeconomic coordination and macroeconomic imbalance in the system. This suggests an institutional cost on the sustainability of such a union involving countries with deficit tendencies. Secondly, potential members of the monetary union loose alternative financing instruments, implying that the deficit would be shared in the same manner as seigniorage revenue may be shared among members, which may be costly. Grabner (2003) notes that once a country joins a monetary union, it is likely to face constraints on the financing options that could lead to suboptimal situations. This consideration offers a corresponding theoretical link between fiscal deficit financing and the loss of seigniorage as a financing instrument (Easterly, 1999, Debrun, Masson and Pattillo, 2005 and Hefeker, 2008). The economic intuition of this is that fiscal policy distortions elicit fears among potential members of a monetary union on the financing implications of fiscal deficits. This is the raison d'être why it has become a critical issue in the discussion of proposals for monetary integration. Instructively, such considerations led to the establishment of the Maastricht criteria for the European monetary unification project at the Copenhagen conference in 1993 and the convergence criteria for the second West African Monetary Zone known as the Accra declaration in 2001. From the above discussion, it seems logically clear that optimum currency area demonstrates a deep and strong theoretical foundation and the analytical apparatus for the analysis of fiscal deficit financing as a cost to monetary unification.

In general, the various elements of the costs of joining a monetary union have received some measures of theoretical consensus as well as divergence among the optimum currency area and the NOCA theorists. However, the economic sense is that the economic state and structure of potential partners of a monetary union may be quite important in evaluating costs, but, the possible use of single currency to mitigate such shocks may be ultimately critical. It seems

reasonably clear that the differences in the economic structures of nations matter. It can be deciphered from the various arguments that both the optimum and new optimum currency area theories appear theoretically inadequate in separately explaining the identified costs elements of monetary unification.

3.1.2 The Benefits of Monetary Union

Forming a monetary union has considerable benefits. The benefits of monetary unification appear in many different forms. According to Mongelli (2010), the overall benefits of monetary integration can be classified into three; the benefit from improvements in microeconomic efficiency, improvements in macroeconomic stability and growth, and benefits from positive external effects. The benefits from improvements in microeconomic efficiency result principally from the increased usefulness of money through the liquidity services provided by a single currency circulating over a wider area. Monetary unification eliminates the transaction costs associated with foreign exchange transactions between two countries of a region. The institution of a single currency eliminates the deadweight losses due to currency transactions and the efforts to collect and process information related to exchange rates. Monetary union also provides mechanisms for the elimination of distortions associated with exchange rate uncertainties. Thus, it enhances greater price transparency that discourages price discrimination, decrease market segmentation, and foster competition. The savings from transaction costs and reduced exchange rate risks will result in increase intra-regional trade, lower investment risks, promote cross-area foreign direct investment and enhance resource allocation (Mongelli, 2002; Grabner, 2003 and Ricci, 2008).

Monetary unification provides pivot for establishing macroeconomic stability. The gains derivable from the reduced exchange rate distortion enhances overall price stability, improves access to broader and more transparent financial market as well as increases the availability of external financing. There are also possible gains from reduced inflation and increased output associated with forming a monetary union. Such reputational gains may come from tying monetary policy anchor with countries known with deep commitment towards low inflation. Since, monetary union provide alternative way of transferring monetary policy autonomy to independent supranational central bank, low inflation may be an important gain given the tendency of an independent central bank to deliver low inflation (Barron and Gordon, 1983;

Dixit and Lambertini, 2001 and Corselti, 2008). The use of single currency by group of partner countries often results in the coordination of macroeconomic policies that may help in attaining macroeconomic stability.

In addition, the gains of monetary unification can come from other positive external effects like increased revenue from international seigniorage, reduced need for foreign exchange reserves and simplified international coordination. The principal benefit of savings on transaction costs may be used by members to invest across its shores which may result into positive spillover effects. The decision to give up monetary policy sovereignty could also compel potentially resource abundant countries to provide some fiscal transfer mechanism to resource deficient members of the region. All these are classified as the "network of externalities" effects of monetary unification (Kronbenger, 2004). The above identified benefits of monetary union though appears quite in exhaustive, seem to provide some measures of rationale why a group of countries may want to share a single currency. However, it seems logical to state that not many of such benefits may be measureable in a quantitative manner (Mongelli, 2002). Therefore, tracing the theoretical underpinning of these benefits may provide a lee way to deal with such complexities. Hence, three key elements of benefits; trade creation effects, financial integration and gains from macroeconomic stability are discussed theoretically below with a view to understand and reveal the scholarly gaps in this area.

3.1.2.1 Trade Creation Effects

The link between a common currency and trade creation has been discussed along two theoretical channels in the literature; the optimum currency area and the new/endogenous optimum currency area. The optimum currency area emphasizes that the more open economies are between and among members, the less the effectiveness of exchange rate as a tool of adjustment (McKinnon, 1963). Although it is clear from mainstream economic theory that openness allows for increase in intra-regional trade, the OCA theory, nevertheless, does not suggest any direct link or mechanism between having a common currency and trade flows. It is also evident that possible obstacles including multiple currencies may indeed impede regional trade. Krugman (1997) argues that barriers from trade/monetary cost impede economic growth and welfare. O'Connell (1998) notes that trade promotion and macroeconomic stability remain

the two main benefits of monetary integration. He points that multiple inconvertible currencies are the main obstacle to intra-regional trade in the Sub-Sahara Africa (SSA).

Comparatively, the new optimum currency area theory states that the national monies, transportation costs, tariff and non-tariff regulatory barriers, exchange rate risks, different languages and conventions, different legal systems and information asymmetries impede regional trade. It contends that national monies impose substantial trading costs on regional trade (De Grauwe and Mongelli, 2005). It further argues that such trading costs could be subverted and submerged when group of countries form a monetary union that endogenises these trading costs (Frankel and Rose, 1998, De Grauwe, 2000 and Rose 2000). Thus, monetary integration could become a vehicle for dismantling such barriers and perhaps results in trade creation. The reduction of transaction costs related to a lower number of foreign exchange transactions and exchange rate risks are often considered to be among the most striking benefits of a monetary union. Grabner (2003) says that the savings from using a common currency are more significant for small, open and less developed countries whose currencies are not used for international payments. Of course, when the costs of foreign exchange transactions represent deadweight loss for consumers, their reduction has a social benefit. A potent argument that supports this view hinges on the uncertainty and fluctuation associated with flexible exchange rates system. Multiple exchange rates in a region stampedes trade interaction and exchange rate volatility affects intra/inter-regional trade adversely (Rose, 2000). Exchange rate uncertainties associated with flexible exchange rates system may reduce when countries give up their independent monetary autonomy for a common currency (Rose, 2000 and Rose and Glick, 2001).

The endogeneity of these barriers could facilitate intra-regional trade among partners of a monetary union in the form of/or through the gravity theory of trade. Frankel and Rose (1998) show that a common single currency increases trade openness between members of a monetary union through increased bilateral and regional integration scheme. Accordingly, the bilateral intensity of international trade between two countries, i and j at a point in time t under this arrangement can be stated as;

$$W_{tijt} = (X_{ijt} + M_{ijt})/(X_{it} + X_{1t} + M_{1t} + M_{jt}) \qquad 3.11$$

Where, X_{ijt} denotes total nominal exports from country i to country j during period t; X_{it} denotes total global exports from country i; and M denotes imports. W_{tijt}, indicates greater trade intensity between countries i and j. In the mainstream economic theory of international trade, the impact of total bilateral trade is usually normalized by nominal GDP in the integrating countries instead of total trade: hence, equation 3.11 is written as;

$$wy_{ijt} = (X_{it} + M_{j1t})/(Y_i + Y_{1t}) \qquad 3.12$$

Where Y_{it} is level of nominal GDP in country i at period t and other variables remain as defined in equation 3.11. (In practice we take natural logarithms of both ratios). It is logical and instructive to state that the new optimum currency area provides somewhat richer analytical apparatus in explaining the relationship between common monetary policy framework (single currency) and trade. However, while the link between exchange rate volatility and trade appears generic, the effects of exchange rate volatility on trade remains controversial in the literature, which of course, rest the theoretical foundation between common currency and trade.

3.1.2.2 Financial Integration Effects.

In the literature on monetary union, both the optimum currency area and the new optimum currency area have also sought to provide insights on the effects of monetary union on financial integration. However, the dimension of the OCA in relation to financial integration effects differs from the new OCA theory. The OCA theory contends that financial integration among potential partners of a currency union can lead to more synchronous business cycles and reduce the need for exchange rate as an adjustment instrument (Ingram 1973 and Mongelli, 2002:9). This implies that financial integration is another criterion of the OCA to establish an optimal currency area. It is unclear whether such justification provides basis for analyzing the benefits of monetary unification. In the mainstream economic analysis of the benefits of monetary union, however, the NOCA theory argues that monetary union brings the benefits of increasing financial and capital market integration and activities among members.

Financial integration leads to financial development. Financial development, perhaps, is a broad and complex concept that embraces an assortment of financial instruments, a wide array of financial intermediaries, and a variety of financial market segments. Financial integration comes

in the form of foreign direct investment, equity and foreign portfolio investments. Although there are various indicators of financial development including convergence in interest rate spread, growth of broad money supply to GDP and increase risk sharing. The economic sense is that monetary unification increases the scope of financial markets and instruments which stimulate economic growth as explained by the endogenous growth theory (Pagano, 1988). Intuitively, financial development and its associated growth effects seem to be an important benefit for countries in a common monetary policy network as well as countries intending to form a monetary union.

The theoretical link between financial development and growth is well known and documented in the literature. In the case of developing and emerging market economies, it is empirically established that financial developments can lead to economic growth through financial liberalization and financial deepening (Obiora, 2007). Capital efficiency operates in a monetary union by mobilizing funds from the surplus units to the deficient units or regions. Impliedly, potential members of a monetary union that have relative weak capital and money markets can mobilize fund across their shores through financial and capital market liberalization. Financial integration therefore offers the opportunity for countries to move from a very low level of economic development to a more developed capital and financial market through the externality effects of economic and monetary integration (Kronberger 2004).

Nnanna, *et al*. (2007) and Obiora (2007), showed the theoretical endogenous growth model in which the effect of financial development on economic growth is aptly accounted for. Hence, the production function is modified to relate aggregate output as a function of aggregate capital.

$$y_t = Ak_t \qquad 3.13$$

Where; y_t in equation 3.13 represents growth variable and k_t is the capital stock at time t. Capital is assumed here to be more efficiently allocated which impacts on growth due to the influence of monetary unification. It is assumed that returns to scale are constant and the returns to capital are not diminishing. Only a single good is produced which can be either consumed or invested. The invested good faces a rate of depreciation δ. Then gross investment can be written as;

$$I_t = k_{t+1} - (1-\delta)k_{t+1} \quad 3.14$$

Equation 3.14 indicates that gross investment I_t is equal to the change in capital stock K_t over time. As indicated above, financial agents keep a fraction of savings μ for their intermediation activities. The saving-investment equation becomes

$$\mu S_t = I_t, 0 < \mu < 1 \quad 3.15$$

The steady-state growth rate takes the form

$$g = A\frac{1}{y} - \delta = A\mu S - \delta \quad 3.16$$

As in the case of endogenous growth models with perfect competition, the equilibrium growth rate depends on preference parameters and technology. The higher the level of capital efficiency, A, the faster is the growth rate. Thus, the growth rate is also high if the rate of capital depreciation δ is low. The economic intuition is that monetary union entrenches capital mobility and efficiency which impact on economic growth of participating countries.

From the above theoretical review, it is evident that the new optimum currency area demonstrates a clearer insight on the financial integration benefits of monetary union given the theoretical inadequacies observed in the traditional optimum currency area theory.

3.1.2.3 Gains from Policy Coordination

The network effects of monetary integration provide variant measures of assessing the benefits of joining a monetary union by abandoning autonomous policy instruments of monetary management. Within this domain, the new optimum currency area theory has developed a theoretical link to explore the gain of policy coordination associated with monetary unification. The central thrust of this theory is policy credibility (Mongelli, 2002). The theory emphasizes that monetary union provides the mechanism for establishing independency of the central bank. In open macroeconomics, such independence granted to the central bank helps in achieving credible policy targets (Iyoha, 2003). These often results in the transparency of prices, macroeconomic stability and increase resource allocation (Mongelli, 2010). This theory is known as policy delegation. In the mainstream economic theory, policy delegation appears to be potent economic policy framework for addressing time inconsistency problem of monetary policy for

countries saddled with weak institutional interaction between the fiscal and monetary policy authorities (see, Kydland and Prescott, 1977 and Barro and Gordon, 1983).

Following from the above, similarity of pre-union economic state and structures vis-à-vis inflation rate across countries has been suggested as an important criterion in the determination of an optimal currency area. The basic idea is that countries may have different Phillip's curve or different inflation-unemployment trade-offs, in which case a currency union, by imposing a unique level of inflation, would generate some costs (Ricci, 2008). However, Mongelli (2002) and De Grauwe and Mongelli (2005) argue that for a country with track record of relatively higher inflation and a reputation for breaking low inflation promises, a way to immediately gain a low inflation credibility is to tie its hands by forsaking national monetary sovereignty and establish a complete monetary union with a low inflation countries. O'Connell (1998) points that trade and monetary integration would compel countries with poor macroeconomic history to improve through the convergence of their policies because of rules and surveillance. Thus, monetary unification can serve as an effective agency of restraint for undisciplined policymakers (Collier, 1991; Cobham and Robinson, 1994; Guillaumont and Guillaumont, 1989; Masson and Pattillo, 2001; Debrun, Masson and Pattillo, 2005 and Hefeker, 2008).

Monetary integration, therefore, may be an effective vehicle for attaining macroeconomic stability (Baldwin, 1998 and ECB, 2005). The emphasis is that policy discretion creates the incentives for policymakers to incur budget deficit which leads to inflation but nations can overcome this by having an independent central bank through the instrument of a common central bank. Beetsma and Bovenberg (1998) demonstrate that monetary unification strengthens policymakers to credibly fight inflation. This mechanism creates a game strategic behaviour between the fiscal and monetary authorities. For instance, the common monetary authority sets inflation target for the countries upon which the fiscal authorities follow in setting tax rates and spending. Beetsma and Bovenberg (1998) characterized a theoretical model on how monetary union delivers low inflation by limiting the scope of fiscal spending that leads to inflation. The model assumes a monetary union with n fiscal authorities, one in each participating country and a Common Central Bank (CCB). The framework assumes a society i's welfare or loss function defined over the consumer price inflation, output and public spending as;

$$V_{S,i} = \tfrac{1}{2}\left|\alpha_{\pi S}\pi^2 + (x_i - \tilde{x})^2 + \alpha_{gS}(g_i - \tilde{g})^2\right|, \alpha_{\pi S,}\alpha_{gS} > 0 \qquad 3.17$$

Equation 3.17 indicates that welfare loses increase in the deviations of inflation, logs of output and government spending from their targets respectively. The model considers the case where the target of inflation is set at zero defining price stability and the target for output amounts to the non-distortionary level x. The target for government spending g is also assumed as the optimal share of non-distortionary output to be spent on public goods, if non-distortionary lump-sum taxes are available. The parameters $\alpha_{\pi S}$ and α_{gS} denote the weights of the inflation and government spending objectives respectively relative to the weight of the output objective, which is normalized to unity. The preferences and objectives of policymakers and society differ in some rights, thus, the country i's government loss function can be stated as:

$$V_{F,i} = \tfrac{1}{2}\left|\alpha_{\pi F}\pi^2 + (x_i - \tilde{x})^2 + \alpha_{gS}(g_i - \tilde{g})^2\right|, \alpha_{\pi F} \geq 0 \qquad 3.18$$

Assuming that the government weight on inflation $\alpha_{\pi F}$ differs from the corresponding weight of the society, $\alpha_{\pi S}$. In particular, if $\alpha_{\pi F} < \alpha_{\pi S}$, government may be opportunistic in the sense that it puts too high a relative weight on output and public spending. Thus, the government selects the tax rate and public spending under the restriction of its budget constraints stated below;

$$g_i + (1 + \rho + \pi^e - \pi)d = \tau_i + k\pi + \theta_i \qquad 3.19$$

Where ρ is the constant real interest rate and $d \geq 0, \theta_i$ and $k \geq 0$ (a constant) are, respectively, the exogenous stock of single-period non-index government debt, lump-sum tax revenue, and real money holdings as a share of output in the absence of distortions. This assumption is tenable if all countries share equally in the seigniorage of the CCB. Accordingly, seigniorage revenues accruing to country i is given by $k\pi$.

In equilibrium, if expectations are rational the constraint equation is rewritten as;

$$K \equiv \tilde{g} + (1 + \rho)d + \tilde{x} - \theta = \left[\tau_i + \tilde{x}\right] + k\pi + \left[\tilde{g} - g_i\right], \qquad 3.20$$

This equation represents the government financing requirement K. It is defined as government spending target $\tilde{g}$, debt servicing costs, $(1+\rho)d$, and a labour subsidy used at offsetting the

implicit tax on output $\tilde{x}$, net of the maximum available amount of lump-sum taxes $\theta < \tilde{g} + (1+\rho)d + \tilde{x}$, which is assumed equal for all countries. The right hand side of the equation represents the three sources of finance: explicit and implicit tax $\tau_i + \tilde{x}$, seigniorage revenues, $k\pi$, and the shortfall of government spending from its target $\tilde{g} - g_i$.

Under a fiscal leadership arrangement, monetary policy would be set first before fiscal policy since it adjusts more quickly than fiscal policy. Thus, after the CCB sets inflation rate, the fiscal authorities set spending so as to balance the budget. It is implied that even when the independent common central bank (CCB) is unable to commit, but sets monetary policy for the entire union such that its preferences is given as;

$$V_{CCB} = \tfrac{1}{2}\left\{\alpha_{\pi M}\pi^2 + \sum_{i=1} n\left[\left(x_i - \tilde{x}\right)^2 + \pi_{gS}(g_i - \tilde{g})^2\right]/n\right\}, \alpha_{\pi M} > 0 \qquad 3.21$$

The CCB's public government spending weight coincides with societies' public spending weight α_{gS}. Therefore, if $\alpha_{\pi M} = \alpha_{\pi S}$, the objective function of the CCB amounts to an equally weighted average of the individual societies' objective functions. The CCB in recognition of this fact sets the inflation rate so as to minimize the preference function subject to the constraint, the taxes and public spending selected by the governments and the expected inflation rate. This yields the inflation reaction function of the CCB through a process of optimization:

$$\pi = \left(\frac{1}{\alpha_{\pi M} + 1}\right)\left(\pi^e + \frac{1}{n}\sum_{i=1} n\left(\tau_i + \tilde{x}\right)\right), \qquad 3.22$$

So that $\delta\pi/\delta\tau_i = (1/n)(1+\alpha_{\pi M})^{-1}$ and $\delta\pi/\delta g = 0$. Higher expected inflation or higher taxes and non-tax labour market distortions in any of the participating countries induce the monetary authority to raise inflation in order to protect employment. However, the relative weight the CCB attaches to employment in county i is only $1/n-th$ of the weight a national central bank would attach to employment if monetary policy would be determined at the national rather than the union level. As a direct consequence, the boost to inflation as a result of an increase in τ_i is only $1/n-th$ of the corresponding increase under national monetary policymaking. Therefore, the

impact on the union-wide inflation rate of unilateral changes in the tax instrument declines when more countries participate in the union. Intuitively, in a larger monetary union, the strategic position of an individual government in relation to the common central bank weakens, given that low inflation target remains the ultimate target of policymakers in a monetary union.

However, Aizenman (1993) observes that monetary unification could produce inflationary bias and excessive public spending with the argument that country can afford to incur deficit with the expectations that seigniorage revenue would be shared equally. Intuitively, the hard decision to enter into a monetary union is the raison d'être for intending countries to overcome this moral hazard of controlling unguided spending that distort monetary policy management and credibility.

Overall, the theoretical views on the costs and benefits of forming a monetary union portray some level of consensus and divergences. Evidently, it is clear that both the optimum currency area and the extended optimum area theories appear inadequate to separately demonstrate an all inclusive cost-benefit analysis of joining a monetary union. The emphasis on the costs side of the OCA could not underpin some direct benefits while the benefits of monetary union have been discussed by the extended OCA in various perspectives without recourse to the direct consequences of losing independent monetary policy autonomy. In a simple term, a major improvement is to provide a unifying framework of both considerations for a robust welfare analysis of monetary union that could correct these gaps.

3.2 Methodological Review

Different methodologies have been applied in the literature to explore the costs and benefits of forming a monetary union. However, the various methods advertise several weaknesses in the analysis of the costs and benefits of sharing a common monetary policy and a single central bank, yet, there is no all inclusive welfare analytical method for evaluating monetary unions (Ogunkola, 2005 and Mongelli, 2002 and 2010). Following the issues identified in the theoretical review, the models are discussed within different approaches covering the costs and benefits analysis in the literature.

3.2. 1 Costs of Monetary Union

Three major costs of monetary union; asymmetric shocks, loss of independent monetary policy and fiscal policy distortion/financing that are empirically tenable and applicable to the second west African monetary zone have been discussed below. Others have not received much empirical measurement in the literature and may be fraught with measurement difficulties.

3.2.1.1 Asymmetric Shocks

Earlier attempts to determine the net-benefit of monetary union focused on the measurement of shocks symmetries among countries (Bayoumi and Eichengreen, 1992; Bini-Smaghi and Vori, 1994; Bergman, 1999; Ferrari-Filho, 2001; Ogunkola, 2001 and 2005 and Ogunkola and Jerome, 2005). These authors utilize different related models including aggregate demand and supply disturbance model (Bayoumi and Eichengreen, 1992; Bouyomi and Ostry, 1997Z), cluster analysis (see Debrun, Masson and Pattillo, 2010) and real exchange rate variance models (Vaubel, 1978; Ogunkola, 2005 and Ogunkola and Jerome, 2005). Cluster analysis involves purely determining whether group of countries in a cluster converges using the OCA properties. The limitation of this approach is instructive since it focuses only on the OCA criteria and not the direct costs of monetary union. Perhaps, the focus of this study is on costs of monetary union.

Real exchange rate variance model involves the determination of the variation in real exchange rate as a measure of asymmetric shocks. Ogunkola (2005) drawing on Von Hagen and Neumann (1994) develop a model to compare real exchange rate variation between the non-CFA countries (group A) and the CFA zone (group B) in ECOWAS. He specified a generic Real Exchange Rate (RER) model as;

$$Q_{aib,t} = P_{ai,t} + S_{abi,t} - P_{b,t} \qquad 3.23$$

Where, $Q_{aib,t}$ is the logarithm of the real exchange rate between country i in group A and any country in group B at time t. $P_{ai,t}$ is the consumer price index (CPI) of country i in group A, at time t expressed in logarithm. $S_{abi,t}$ is the logarithm of the nominal exchange rate between country i's currency (i belonging to group A countries) and the currency of group B countries at

time t. $P_{b,t}$ is the logarithm of the CPI of country j in group B at time t. Further innovation was to obtain the variances as the observed changes in RER by estimating the model below for country i in group A $DQ_{aib,t}$ and any other country in group B at time t as;

$$DQ_{aib,t} = \sum B_m D_m + e_{aib,t} \qquad 3.24$$

Where, B_m are the parameters to be estimated, D_m are the quarterly dummies of exchange rates and $e_{aib,t}$ are the regression residuals interpreted as the seasonally adjusted RER changes. The variances of real exchange rate between country j and k of the CFA zone is modeled as;

$$DQ_{bjbk,t} = \sum B_m D_m + e_{bjbk,t} \qquad 3.25$$

Where, $e_{bjbk,t}$ of equation 3.25 is the residual of the regression interpreted as the seasonally adjusted RER changes. In order to eliminate the unexpected components of the seasonally adjusted RER changes, RER changes were regressed against their lags to obtain estimates using vector autoregressive method. The residuals from the autoregressive models were referred to as RER shocks and the variances as the conditional RER variances.

Despite the link between the OCA properties and exchange rate, there are two caveats peculiar to this approach. First, the determination of acceptable benchmark of real exchange rate variation for comparison is a major issue. Second, the use of observe real exchange rate variance within an existing union and the comparison of RER among countries with different economic structures is defective. The thrust of this method of analysis clearly indicates that real exchange rate variation model is the same as other models determining the optimality of the OCA criteria rather than costs of monetary union.

The output demand and supply disturbance model is the most popular approach of measuring shock symmetry in the literature (Bayoumi and Eichengreen, 1992; Bayoumi and Ostry, 1997 and Bergmann, 1999). This approach suggests that asymmetric shocks arise due to output and productivity changes among members of the union. This involves determining the shocks to output and prices following the Blanchard and Quah (1989) shocks decomposition approach. Bayoumi and Eichengreen (1992) develop structural variance decomposition model on aggregate demand and supply disturbances in 11 European communities. Their central focus is

the determination of demand and supply disturbances using price and output variation as a measure of the nature and degree of shocks symmetry in the (then) proposed European monetary union. They specified a shock model with a vector of price and output in a transformed matrix form as;

$$X_t = B_1 X_{t-1} + B_2 X_{t-2} + ... + B_n X_{t-n} + e_t$$

$$= (1 - B(L)^{-1} e_t \qquad 3.26$$

$$= (1 + B(L) + B(L)^2 + ...) e_t$$

$$= e_t + D_1 e_{t-1} D_2 e_{t-2} + D_3 e_{t-3} + ...$$

Where; e_t represents the residuals from the equations in the vector auto-regression and the vector B represents the estimated coefficients of the equation. It implies that e_t, is composed of the residuals of a lagged values of Δy_t and Δp_t (output and prices) on current values of each in turn and labeled e_{yt} and e_{pt} respectively. The residual e_t is then transformed into the demand and supply shocks ε_t. The outcome and nature of these shocks were then utilized to determine the movement of shocks within the region. This method, however, has its short-comings. The essential drawbacks of the Bayoumi and Eichengreen (1992) model are numerous. First, the model does not predict the dynamics of change in the historical data after monetary union has been formed. Second, the factors that account for the variances in output and prices were not taken into consideration. For instance, output is composed of imports from other regions through which business cycles from a given region may complement the variances in output and prices in the domestic country (Bergmann, 1999). The variation in output may be exemplified by productivity shocks that impact on the terms of trade.

Masson and Pattillo (2001) added that asymmetric shock in real output of WAMZ results from terms of trade shocks and fiscal policy distortion. They noted that shocks to the terms of trade are typically not well correlated, due to large differences in commodity exports and the fact that world prices of the various commodities do not move together which could make the costs of monetary union relatively high. They calculated the standard deviation of the terms of trade

among member countries of WAMZ as shocks. This method is also fraught with the same limitation given that the focus is not to capture direct costs of monetary union.

WAMI (2005) in their influential study derived standard deviations of the terms of trade to determine the size of shocks as well as the correlation of the shocks to establish the nature of shocks among WAMZ nations. WAMI further developed a Generalized Purchasing Power Parity (G-PPP) type model based on VAR to determine whether exchange rate could actually respond to asymmetric shock given that asymmetric shocks make exchange rate a costly instrument to lose in monetary union. The structure of the model is based on determining whether a co-integration among variables exists. The G-PPP model is specified as;

$$r_{1it} = B_0 + B_{11}r_{11t} + B_{12}r_{12t} + ... + B_{1m}r_{1mt} + \varepsilon_t \qquad 3.27$$

where, r_{1it} is the real exchange rate of the countries in period t, B_0 is an intercept, B_{1it} is the parameter of the co-integrating vector and ε_t is a stationary stochastic disturbance error term. The first procedure was the computation of real exchange rates for the countries in the form of

$$r_{1it} = S_{1it}\frac{P_{it}}{P_{it^*}} \qquad 3.28$$

Equation 3.28 indicates that real exchange rate is nominal exchange rate multiplied by the ratio of domestic price to foreign price over time as in the standard international finance literature. Further innovation was to analyze the role of nominal exchange rate as a shock–absorber in the WAMZ countries by examining the response of the exchange rate to real and nominal shocks. Drawing on the various sources of shocks, three variable VAR model associated with output, consumer price index and exchange rate were utilized and specified as;

$$X_t = \left[\Delta Y_t, \Delta P_t, \Delta e_t\right] \qquad 3.29$$

Where, X_t is the vector of the various components of shocks in a log form. Transforming these in VAR form helps to establish the effect of individual variable to aggregate idiosyncratic shocks.

$$A_0 x_t = A(L)x_{t-1} + \varepsilon_t \text{ with}, \varepsilon_t \equiv iidN(0, \sum \varepsilon) \qquad 3.30$$

Where, A, a 3 x 3 matrix of contemporaneous coefficients is a polynomial of order p in the lag operator L. The vector of $\varepsilon_t = [\varepsilon_t^{xr} \quad \varepsilon_t^{rgd} \quad \varepsilon_t^{cpi}]$ represents the idiosyncratic shocks associated with each endogenous variable that drive aggregate fluctuation. The above VAR model is then used to determine how much exchange rate responds to output and price shocks in nominal and real terms as basis for evaluating the impact of losing exchange rate to asymmetric shocks. If nominal shock predominates, it is taken that nominal exchange rate may not be a potent instrument in response to macroeconomic imbalances. The idea is that if asymmetric shock prevails, then it will be costly to lose exchange rate for domestic adjustment.

Holistically, this modeling approach appears as a better approximation of the response of exchange rate to idiosyncratic shocks in monetary union as a measure of the cost of losing monetary autonomy. The model, however, did not capture the sources of the shocks itself. The link between output shocks correlation between two countries is influenced significantly by their terms of trade which also depend on the variability of exchange rate as an instrument of adjustment to domestic and foreign shocks (Mongelli, 2010 and Ricci, 2008). It is suggested that terms of trade shock is influenced by the changes in exchange rate (Obstfeld and Rogoff, 1995). The insight provided by these models indicates that major improvement of the gaps would be to draw the link between source of shock and exchange rate.

3.2.1.2 Loss of Independent Monetary Policy

Empirical methods for estimating the cost associated with the loss of independent monetary policy autonomy in the literature is scanty. This could be adduced to the difficulty in projecting the loss associated with the giving up of independent monetary policy sovereignty against joining a common monetary policy framework. Most analysis regarding independent policy often make predictions based on calibrations along theoretical views and not based on empirical methods. Drawing from the passive role assigned to exchange rate in the OCA theory, the costs associated with the lost of exchange rate bears closer link from the asymmetric shock argument rather than the loss of exchange rate as a tool of adjustment (Ricci, 2008). However, the loss of seigniorage due to monetary unification has also received limited empirical attention.

The loss of monetary policy autonomy has been approximated and estimated by calculating seigniorage loss due to monetary union (Masson and Pattillo, 2001 and Ogunkola, 2005). In the

mainstream economic literature, seigniorage is defined in different ways which also influences significantly its measurement. Within the domain of monetary union, empirical models estimating seigniorage were built on calibration to generate inflation tax (Masson and Pattillo, 2001; Ogunkola, 2005 and Miyakoshi, 2008). These models draw from the World Bank (1994) empirical model of calculating seigniorage specified as;

$$S = \frac{\Delta(M)}{Y} g(\frac{M}{Y}) . \qquad 3.31$$

Where, M is nominal money supply, Y is nominal GDP and g is the real GDP growth rate. The rationale behind the use of such model is unambiguous. A better indicator of whether monetary policy is supportive of a stable macroeconomic environment is the degree to which governments rely on printing money to finance budget deficits (World Bank, 1994). There are a number of possible factors that give rise to the reliance on seigniorage revenue which includes low and weak revenue (tax) base, high unsustainable debt profile and lack of economic development (Nieberding, 2004 and Aisen and Veiga, 2005). Debrun, Masson and Pattillo (2005) argue that fiscal indiscipline prominent in the sub-Saharan African region due to poor institutional framework often leads to the reliance of this policy handle (see, Easterly, 1999 and Hefeker, 2008). These views point to the fact that budget deficit is the factor that stems the use of money creation instrument. Thus, Debrun, Masson and Pattillo (2005) modified the model by endogenizing seigniorage revenue in the specification of the cost of joining a monetary union (see, equation 3.10). However, the model does not account for the determinants of seeigniorage in the zone.

It seems valid to note that the above seigniorage model nonetheless is viewed as revenue generated by the government in the form of inflation tax and not the ability of the central bank to create monetary liability to ensure optimal government finance framework (Mankiw, 1987).

3.2.1.3 Fiscal Policy Distortion/Financing

Empirical methods of estimating the effect of fiscal policy distortion as a cost to monetary unification has also not received much empirical investigation. However, given the theoretical insight on fiscal deficit and its financing implications, DMP (2005, 2010) developed a revenue model to estimate the impact of financing needs (FN), average seigniorage of the union (SNG)

and the amount of intra-union trade on tax revenue ($\theta_{A,i}$) on the revenue to GDP of integrating countries. It is intended to generate parameters that influence fiscal deficit so as to determine whether the proposed regional grouping of countries into monetary unions could increase welfare for the countries involved. They projected this idea by using this specification;

$$R = \gamma_1 + \gamma_2 FN + \gamma_3 SNG + \gamma_4 \theta_{A,i}, \qquad 3.32$$

Where R is revenue, *FN* is the Financing Needs of the country, average seigniorage of the union *SNG* and $\theta_{A,i}$ is the amount of intra-regional trade on tax revenue. The parameter estimates of the model were then calibrated into a welfare analytical model of determining the effect of fiscal policy distortion among other variables on monetary union. The foundation of this model rests on the view that fiscal deficit financing is the major challenge of African nations such that monetary union could help to address.

Although the DMP model seems to approximate the character of African countries, its validity may be contentious. There are principally two problems associated with adumbrating this model to proxy for fiscal policy distortion as a cost element to monetary unification. First, the model does not directly underpin the cost of losing monetary policy. Second, the variables used for the calibration may not be tenable for WAMZ economies with weak intra-regional trade. However, the theoretical undertone suggests determining whether countries with poor fiscal deficit record could be attractive for a common monetary policy framework of a monetary union. Therefore, a sufficient model will be to include fiscal deficit financing determinant given that deficit itself is the factor that leads to distortion in the interaction between fiscal and monetary policy.

3.2.2 The Benefits of Monetary Union

Several models have been utilized in the analysis of the benefits of monetary integration. The major elements as provided in the theoretical review include the trade creation effects, the capital and financial market effects and the impact from policy coordination and are discussed below.

3.2.2.1 Trade Creation Effect

The impact of monetary union on trade has been widely investigated empirically in literature (Emerson, *et al.,* 1992; Frankel and Rose, 1998; Rose, 2000; De Grauwe, 2000 and 2003; Alesina and Terenyro, 2002 and Nnanna, *et al.*, 2007). The reduction in transaction cost and exchange rate risks model (Ogunkola, 2005 and Nnanna, *et al.*, 2007) and the gravity model (Emerson, *et al.*, 1992; Frankel and Rose, 1998; Rose, 2000; De Granwe, 2003 and Nnanna, *et al.,* 2007) are two main approaches of measuring the trade creation benefits of monetary union. The first method involves calculating total intra-regional trade that did not require the use of foreign exchange with total value of intra-regional trade. A major caveat of this technique is that such method appears mechanical since it involves mainly statistical measurement. However, the gravity model seems to be the most popular model for estimating the impact of monetary integration on trade in the literature. Its foundation is largely derived from the general equilibrium framework for projecting trade creation effects. Nnanna, *et al.,* (2007) specified a gravity model as;

$$TF = \theta_1 + \theta_2 GDPs + \theta_3 DIS + \theta_4 POP + \theta_5 TF_{-1} + \varepsilon \qquad 3.33$$

Where TF represents the trade creation effect, and $GDPs$, DIS, POP, POP are the gross domestic product, distance and population which captures the control variables in the model while ε is the stochastic error term. Although the model has some limitations associated with its large data requirement, the gravity model, however, portends a standard model of measuring the effect of monetary union on trade in the literature given its ability to endogenize the barriers of trade and make projections on intra-regional trade in a dynamic framework when countries are integrated in trade.

3.2.2.2 Financial and Capital Market Effect

Financial integration benefits of monetary union has been widely explored and estimated in the literature using different models (Sy, 2006; Cabral, 2002; Kronberger, 2004 and Nnanna, *et al.,* 2007). Sy (2006) suggests that the convergence of interest rate spread over time proxies for greater financial integration while divergence indicates increased competition. According to Nnanna, *et al.* (2007), sigma-convergence assesses the extent to which markets are already

integrated. It is calculated by building a time series of the cross-sectional dispersion in lending interest rates, R_i in a country i.The sigma-convergence starts with generating a standard deviation in interest rates across countries as;

$$\sigma_t = [1/n-1 \sum (R_{i,t} - R_t')^2]^{1/2} \quad 3.34$$

Where R' is the mean at time t.The speed at which the cross-sectional dispersion decreases over time can also be computed by a regression of the cross-sectional dispersion on a time trend of the model below;

$$\sigma_t = \beta_t + \varepsilon \quad 3.35$$

Where, σ_t captures the interest rate deviation over time, β_t is the parameter estimate of the time variable and ε is the stochastic error term. Cross-sectional dispersion may be advantageous to correlation given that it can be calculated over time. When series are highly correlated, as they should be in markets, interest rates will generally move in the same direction, and instantaneously cross-sectional dispersion will be very low. On the alternative, dispersion will be high when the drift in interest rate differs in different countries.

In the same vein, the Beta-convergence measures the speed of convergence. It estimates whether banks' interest rate spread in countries with relatively high spreads have a tendency to decrease more rapidly than in countries with relatively low spreads. The model for the estimation is specified as,

$$\Delta S_{i,t} = \alpha_i + \beta S_{i,t} + \sum \gamma \Delta S_{i,t-1} + \varepsilon_{i,t} \quad 3.36$$

Where, $S_{i,t}$ represents the difference R_i between banks' interest spreads in country i and a relevant benchmark, Rb. Δ is the difference operator, and α captures the country dummies. The benchmark is the country with the lowest banks' spreads in the region during the period. β is a direct measure of the size and speed of convergence in the region. A negative β coefficient indicates that banks' spreads in countries with relatively high interest rates have a tendency to decrease more rapidly than in countries with relatively low interest rate spreads. The above models though capture the element of financial development, its thrust might not underpin the

direct channels through which financial globalization could impact on the growth of the integrating countries. Secondly, such models may be applicable to widely integrated economies like the European financial sector and not the case of WAMZ with relatively less developed financial system. It is expected that such a developed robust financial system would increase or impact on the risk sharing mechanism among agents in the financial market.

However, the argument that financial development propelled by monetary integration enhances financial efficiency that impinges on growth in a region informed the development of general equilibrium model of growth (Pagano, 1988 and World Bank, 2008). Kronberger (2004) and Nnanna, *et al.* (2007) estimated the impact of financial integration on growth with the capital efficiency model specified as;

$$g = \alpha + \beta_i Y + \lambda_i Z + \varepsilon_i \qquad 3.37$$

Accordingly, g is the real growth of output, Y represents a set of financial development variables including growth in credit to the private sector, interest rate differential between lending and deposit rates and the income velocity. Z is the set of control variables and channel through which monetary integration impact on economic growth. An important advantage of this model is that it can be applied to any region irrespective of their structure.

3.2.2.3 Policy Coordination/Delegation Effect

It is difficult to empirically quantify the impact of monetary integration on macroeconomic stability (Mongelli, 2002). However, the effect of monetary union on inflation has been investigated theoretically and empirically based on general equilibrium models (Beetsma and Bovenberg, 1998, 2000; Lane, 2000; Cooper and Kempf, 2005; Masson and Pattillo, 2002; Debrun, Masson and Pattillo, 2005; Gali, 2008 and Corselti, 2008). Debrun, Masson and Pattillo (2005, 2010) drawing on the theoretical basis of the Beetsma and Bovenberg (1998) and Martins, (1995) models specified an inflationary biased model as:

$$\pi_i = \phi_1 + \phi_2 FNA - \phi_3 \theta_{A,i} + \varepsilon_i \qquad 3.38$$

Equation 3.38 indicates that inflation π depends positively on a country's financing need FN or rather the average financing needs of the union members FNA and the amount of intra-union

trade $\theta_{A,i}$. The projection is that joining a monetary union may help to underpin fiscal discipline and increase intra-union trade that stems inflation in the weak structural economies of the sub-Saharan African nations. A major challenge may be measurement problem associated with the determination of the variables. However, such model appears relatively appropriate in approximating the macroeconomic stability on the average.

One major methodological gap apart from the limitations of the various models is evident. The costs and benefits of monetary union were measured by different authors in different ways depending on the element being used to describe the phenomenon. None of these studies so far examined contained a comprehensively modeling of both the cost and benefit elements of monetary union.

3.2.3 Key Variables/Data Review

Empirically, the variables for the estimation of the costs and benefits of monetary union vary. Bayoumi and Eichengreen (1992) utilize output and prices, Ogunkola (2005), Ogunkola and Jerome (2005) used real exchange rate variation while Masson and Pattillo (2001) and Debrun, Masson and Pattillo (2005) employed terms of trade variance to generate data for asymmetric shock. The use of different variable depends on the approach shocks is viewed. The terms of trade is calculated as the ratio of export price to import price. A change in the monetary base over GDP was used to obtain seigniorage revenue (World Bank, 1994; Masson and Pattillo, 2001 and Ogunkola, 2005). Financing needs or average financing needs is derived from the total government planned expenditures or the average for the countries in the case of existing monetary union. Openness was used as trade flows between countries to measure the impact of trade integration while the difference between deposit and lending rates capture interest rate spread, an index of financial development (Nnanna, *et al.* 2007).

Data is an important tool in any empirical analysis. Evidently, measurement of the net-benefit of monetary union is well documented in the literature albeit data constraints. Although it is valid and easy to estimate the costs aspect using historical data, the data on the benefits often rely on projections based on available evidence. A persuasive argument on monetary union has been that it may be unreliable to estimate the costs and benefits of proposed monetary union, but the country's macroeconomic performance over time and the level of integration into the world

economy portends a better way to adumbrate the welfare analysis of monetary union (see, Madhur, 2002 and Mongelli, 2010).

Time series data and panel data are two popular data techniques used in the analysis of costs and benefits of monetary union. An advantage with time series data is that it is better when considering individual country analysis while panel gives more robust estimate when dealing with group or cross-sectional estimation. Studies anchored on time series data (country analysis) include Vaubel (1978), Ogunkola (2005), Ogunkola and Jerome (2005) and WAMI (2005) that employed real exchange rate variation between countries. Bayoumi and Eichengreen (1992), Bergman (1999) and Ferrari-Filho (2001) utilized output, money supply, inflation, interest rate and exchange rate of the countries. However, Ogunkola (2001) and Masson and Pattillo (2001) derived the terms of trade between countries from imports and exports prices while Debrun, Masson and Pattillo (2005) employed government expenditure, tax revenue, fiscal deficit and seigniorage revenues for the period 1995-2000.

However, Anyanwu (2003) and Nnanna *et al.* (2007) utilised the panel data technique to estimate the effects of monetary integration on trade in the WAEMU and the trade and financial integration benefits of the second West African monetary union respectively. In effect and to remain tractable with the objective of the study, both the time series and panel techniques would be utilised. Time series data would be employed for the country analyses while panel data technique would also be utilised for the group analysis. Panel data techniques offer a good way to increase sample sizes and the exploitation of data variations.

3.3.4 Review of Estimation Techniques

In terms of estimation, the Vector Auto-Regressive (VAR) procedures and correlation of shocks are prominent methodological techniques adopted by the shocks founded studies (Vaubel, 1978; Bayoumi and Eichengreen, 1992; Erkel-Rousse and Melitz, 1995; Frankel and Rose, 1998; Bergman, 1999; WAMI, 2005; Ogunkola and Jerome, 2005 and Ogunkola, 2005). The VAR approach places minimal restrictions on how shocks from variables affect the economy. Econometricians have demonstrated that VAR procedures assume interrelationship and interdependence among economic behavioural aggregates without recourse to theory. The choice of VAR may be influenced by the standard technique in measuring shocks in industrialized

countries as pioneered by Blanchard and Quah (1989). Bayoumi and Eichengreen, (1992) and Frankel and Rose, (1998) utilized the VAR technique while Bergman, (1999) applied correlation of shocks on output, money supply, inflation and real interest rate for the Scandinavian currency union covering the period 1893-1913. Bergman (1999) further distinguished between symmetry of shocks and symmetry of economic structures using the same technique.

In West Africa monetary union, Masson and Pattillo (2001) utilise correlation of shocks to establish whether the ECOWAS region in general and the second West African monetary zone qualify as an optimum currency area. Ogunkola and Jerome (2005) and Ogunkola (2005) constructed real exchange rate variance within the union benchmark as a yardstick to determine the degree of asymmetric shock and compliance of the convergence criteria in WAMZ. They used VAR to estimate real exchange rate changes as a measure of shocks. Perhaps, the same methodological strength and weakness is directly observable in these studies (Bayoumi and Eichengreen, 1992; Frankel and Rose, 1998 and Bergmann, 1999). The choice is not unconnected with the indisposition of a robust methodology to replicate the analytical construct of the OCA criteria. Besides, VAR is seen as only a better tool for measuring shocks which makes it more restrictive and inappropriate for policy analysis. Ogunkola (2005) points that due to lack of appropriate methodology to measure the OCA criteria, researchers often resort to real exchange rate variation, terms of trade shock and correlation of output shock which are capable of giving parallel results.

However, the caveats of VAR method are numerous. The VAR technique has often been criticized in most empirical economic analysis. Apart from the fact that model specification and estimation using this methodology is not based on any economic theory, VAR techniques are highly restrictive. Attempts to ameliorate the deficiencies associated with the VAR technique may be the reason for employing Ordinary Least Squares (OLS) and the Instrumental Variable (IV) techniques to estimate the net-benefits of monetary union. Debrun, Masson and Pattillo (2005, 2010) employed the OLS to estimate some behavioural models developed to examine the costs and benefits of monetary union in ECOWAS and African sub-region respectively. They used the parameter estimates of these models to simulate a dynamic general equilibrium welfare model for selected African regions and countries. Nnanna *et al.* (2007) utilised instrumental variable technique to estimate the benefits of monetary integration of the second West African

monetary zone (WAMZ) in a panel framework. The difficulties in both techniques vary. The ordinary least square which often goes with time series analysis allows appropriate statistical procedures to test the existence of long run relations and causality between variables. It however, requires sufficient data sets to allow for a high degree of confidence on estimates which may be limited in this study. On the other hand, instrumental variable technique performs better with simultaneous equation models.

Arising from the gaps in the different approaches applied in the literature, this study will develop some macroeconomic behavioural models to estimate the elements of costs and benefits identified in the literature with some modifications to account for the observed deficiencies. First, the costs and benefits elements would be clearly identified and estimated through set of behavioural models derived from the member countries' historical data. Second, the parameter estimates would be utilized to construct composite indices of the costs and benefits indicators. Third, these indicators would then be used to make comparison between and among the participating countries through a cost-benefit technique.

3.3 Empirical Review

Empirical evidences on the costs and benefits of monetary union have progressed rapidly in the literature since the seminal article on optimum currency area by Mundell (1961). The most remarkable advances in empirical research have been the development of methodologies for predicting the potential costs and benefits for regions contemplating the establishment of monetary union. It may be quite revealing to state that most investigation in the literature focused on specific issues and not purely on the overall costs and benefits of joining a monetary union. Hence, this section is reviewed according to the issues identified in the previous sections and upon regional experiences with monetary union.

The first major empirical study on asymmetric shocks was examined by Bayoumi and Eichengreen (1992) employing data on outputs and prices in 11 European community members. Bayoumi and Eichengreen (1992) found more idiosyncratic shocks across European communities than in the United States. For instance, the result of the standard deviation indicates that output fluctuations have generally been somewhat smaller across European communities than across US regions, while inflation variability has been higher in Europe. The correlation

coefficient result indicates that output growth is generally more highly correlated across US regions with 74 percent than EC region with 57 percent even with idiosyncratic behaviours (Bayoumi and Eichengreen, 1992:19). The authors predict that the perceived European monetary union may be costly and difficult to operate.

Similar conclusions were reached by Eichengreen (1993) and Von Hagen and Neumann (1994). In spite of the fairly general recognition of the implications of these results on symmetric shocks, there is a major issue of determining the benchmarks of real exchange rate variation and the degree of outputs and inflation correlations in these studies. First, the use of observed real exchange rate variances within an existing union and the comparison of RER among countries with different economic structures are popular approaches to this problem. Secondly, the choice of an appropriate variable to measure the benchmarks of shock asymmetries is another issue of concern. Thus, the validity of these predictions notwithstanding, lies in the inability of the traditional optimum currency area to draw a clearer synchronization between the OCA criteria and the variables used to determine symmetric shocks.

Bergman (1999) reported that the Scandinavian Currency Union (SCU) does not qualify to be a monetary union in the face of their country-specific shock asymmetries and poor economic structures that are not relatively open to foreign trade. Six macroeconomic aggregates: output growth, money growth, inflation, long-term nominal and real interest rates, and the discount rate were employed to determine the degree of shocks symmetries using correlation and structural autoregressive VAR model for SCU. He finds significant correlation in the pattern of country-specific structural shocks among the Scandinavian countries and less influence of foreign shocks on the SCU's outputs and inflation. For instance, the result reveals on the average that output growth is about 1 percent higher in the Scandinavian countries than in England used as benchmark while the discount rate, interest rates and money growth had over 4 percent correlation coefficients across the SCU. Bergmann found a low 2.24 percent in England, and 3.02 percent in Germany and 3.25 percent average deviation of inflation from output among the Scandinavian currency union except in Norway. The result further indicates that inflation and output variability tend to be lower for member countries than for countries outside the union. But, Bergman argues that the symmetry of shocks may be either due to the similarity of their economic structures or because both countries are dependent on economic developments outside

the two countries (foreign shocks). The striking issue here as posited by Bergman is that the influence of foreign shocks is smaller than the common shocks as claimed by the OCA theory but cannot be taken for the case of SCU. It is noteworthy to state that Bergman bias verdict is based on the weak structures of the SCU and not the case of symmetry of economic shocks.

In the case of the MERCOSUR countries, Ferrari-Filho (2002) reveals that it does not make economic sense to create a monetary union. He argues that given their levels of development and relatively low levels of intra-regional trade and financial integration accompanied by generally poor macroeconomic magnitudes, asymmetric shocks would be substantially high in MERCOSUR. It is implied that asymmetric shocks would make monetary union costly. Ferrari-Filho's prediction was based on projections on the state of MERCUSOR countries available data. This claim contradicts the earlier prediction by Gambiangi (1999) in his proposal of making MERCOSUR a currency union. Though both studies were anchored on symmetric shocks, the divergence in their revelations is not unconnected with the prevailing economic conditions in MERCOSUR in the various periods. Gambiangi notes that MERCOSUR would be closer when they adopt the Maastricht criteria to achieve macroeconomic convergence like the European Union while Ferrari-Filho (2002) proposed the establishment of MERCOSUR Currency Board (MSB) as the only institution that could strengthen their macroeconomic stability and improve their inter and intra-regional trade. One important omission in their predictions is that globalization has further integrated MERCOSUR trade and financial markets like other emerging market economies. The achievement of convergence criteria ex post was not taken into consideration, thus negating the argument of Ferrari-Filho. For instance, Kronberger (2004) revealed also that given the non-existence of de facto institutional mechanism and the nature of the prevailing asymmetric shocks, MERCOSUR need not start negotiation of monetary union. Nonetheless, the creation of a single MERCOSUR currency could serve as a political lubricant for deepening integration in the region (Kronberger, 2004: 22).

In a related study, Bayoumi and Ostry (1997) examine asymmetric shock on output in African economies using VAR due to the problem of getting price data needed for the separation of the Blanchard-Quah decomposition of shocks into demand and supply. They find lower correlation of shocks to GDP growth around 0.26 percent, 0.31 percent and 0.28 percent affecting countries between the two CFA franc zones, ECOWAS, COMESA, and SADC

respectively. They conclude that correlation of shocks may not be appropriate basis for the existence or creation of monetary union in Africa. Similarly, Horvath and Grabowski (1997) employed price and output data using the Blanchard-Quah decomposition of demand and supply shocks. They reported that asymmetric shocks due to supply shocks were more prominent in Africa which could make monetary union costly. This result does not corroborate the earlier findings of Devarajan and de Melo (1987, 1990) and Fielding and Shields (2001) that found positive and high output shocks correlation in the CFA zones using GNP growth rates. The use of output shock as basis of determining shocks appears inadequate since output correlation particularly from supply shocks originates from terms of trade shocks and the effectiveness of exchange rate as an adjustment tool (Debrun, Masson and Pattillo, 2005 and Ricci, 2008).

The conclusions reached for the case of the ECOWAS, however, is mixed. Masson and Pattillo (2001) found large movement of the terms of trade, high and negative correlation of shocks for several ECOWAS countries particularly WAMZ nations. For instance, the terms of trade shock between1980-1996 is reported as Gambia 18.6 percent, 11.1 percent for Ghana, 6.3 percent for Sierra Leone, 7.3 percent Guinea while Nigeria had the highest with 21.5 percent due largely to the changes in the world price of oil. They also reported not well correlated terms of trade shock below 0.3 percent on the average across WAMZ member countries. They predict that monetary union in ECOWAS involving Nigeria may not be beneficial given the large differences in commodity exports and prices that do not move together in the zone which accounts for the non-synchronization of shocks. Similar predictions were reached by Masson and Pattillo (2004), IMF (2005) and Debrun, Masson and Pattillo (2005).

However, the results of Ogunkola and Jerome (2005) and Ogunkola (2005) using different approaches acknowledge the viability and capability of the project to boost inter and intra-regional trade in ECOWAS. Using real exchange rate variance as a benchmark to determine the degree of asymmetric shocks in ECOWAS, Ogunkola (2005) reported that the region was closer than before given the lower standard deviation value for the post-SAP than the pre-SAP period. The result reveals that intra-CFA shocks ranged between 0.0267 and 0.0429 and intra-non-CFA countries range between 0.0913 and 0.197 for the period 1970 to 1997. However, the result indicates that intra-CFA RER shocks ranged from 0.0311 to 0.0505 between 1970 and 1986 as against 0.0176 to 0.0463 found in the post-SAP period. Comparatively, RER ranged from 0.0857

to 0.227 during the pre-SAP and a lower range value of 0.09 and 0.115 for post-SAP period in the non-CFA West Africa countries. The results suggest that real exchange rate variability has reduced in both CFA and non-CFA due to SAP but concluded that real exchange rate variance of the CFA zone is smaller than the non-WAEMU due to their monetary union. However, Ogunkola and Jerome (2005) argued in favour of the convergence criteria with emphasis that the case of CFA that adopted monetary union without any precondition cannot be applied to the case of the second West African monetary zone with serious heterogeneities. Other studies including Soyibo (1998), Ogunkola (2001), Iyoha (2003), Jerome (2005), Ogunkola and Jerome (2005) stated that monetary integration could be beneficial to ECOWAS.

The loss of exchange rate and monetary policy autonomy to monetary union in the Economic Community of West African States (ECOWAS) has been investigated by estimating seigniorage revenue over time (Masson and Pattillo, 2001 and Ogunkola, 2005). The result of Ogunkola (2005) reveals that Ghana recorded over 4.35 percent average seigniorage to GDP during the period 1970 and 1985 while Nigeria reached over 4.22 percent during 1986 and 1994 as the countries with highest seigniorage to GDP ratios. Seigniorage to GDP ratio was also found to be very high in Sierra Leone, while Gambia had a moderate growth of seigniorage during the period under review. Niger, Togo and Senegal were among countries in the CFA zone that had the lowest siegniorage to GDP ratio. This result confirms the conclusions of Easterly (1994, 1999), Debrun, Masson and Pattillo (2005) and Hefeker (2008) that the non-CFA zone (WAMZ) relies so much on seigniorage revenue than the CFA countries. Masson and Pattillo (2001) study covering 1995 and 1998 established that seigniorage as policy handle is greater in WAMZ than the CFA. However, they found substantial decline around 0.9 percent in Nigeria, 1.4 percent Gambia and Sierra Leone seigniorage to GDP ratio while Ghana recorded 2.8 percent higher than all countries in both the WAEMU zone and non-WAEMU countries. As a general rule, seigniorage in excess of 1.5 percent of GDP is risky because the economy will eventually fall into inflation trap and seigniorage in excess of 3 percent indicates major macroeconomic imbalances (Fischer and Easterly, 1990 and World Bank, 1994).

The issue of fiscal deficit as a benchmark to determining the cost of joining a monetary union was investigated by Masson and Pattillo (2005) and Debrun, Masson and Pattillo (2005, 2010). Using a simple linear model, Debrun, Masson and Pattillo, (2010) report that inflation in

Sub-Saharan African countries are explained significantly by the countries financing needs and the amount of intra-union trade in the zone. The result reveals that about 54 percent changes in financing needs influence the revenue profile of these countries. Accordingly, financing needs in the zone is the factor that accounts for the substantial reliance on seigniorage revenue. However, the comparative model for WAEMU countries utilized by Masson and Pattillo (2005) indicates that their budget balance to GDP is strongly influenced by the output gap and terms of trade. This confirms the earlier prediction of the impact of monetary union on fiscal discipline. The economic intuition is that since many of these countries concerned are highly dependent on their export revenues and tax receipts on primary commodities whose prices are beyond their control, it is natural to relate the fiscal deficit to changes in a country's terms of trade, as well as to a measure of the cyclical position of the economies.

Furthermore, empirical findings of the trade creation impacts of monetary union suggest mixed results across regions and among authors. Following the earlier predictions of Emerson, *et al.,* (1992) in the report "*One market, One money*", Frankel and Rose (1998) and De Grauwe (2000), document that monetary integration has positive effects on trade. Rose (2000, 2004) applying the gravity model report that intra-regional trade would increase by 3 times greater than it would be due to the effect of monetary integration after controlling for the effects of exchange rate volatility in the EMU. Several studies including Rose (2001), Rose and Engel (2002), De Grauwe and Mongelli (2005), and Mongelli (2002, 2010) also confirm the result known as the Rose effect[5]. However, some studies argue that the effect of monetary unification on trade may have been over estimated for the case of the EMU (Melitz, 2001; Persson, 2001 and Skudelny, 2003). Skudelny (2003) asks whether the mere creation of a currency union leads to an increase in trade, over and above the positive impact generated by the elimination of nominal exchange rate volatility. The implication is that though increase trade arises from the reduction in exchange rate risks and uncertainty but could be misleading.

With regards to the ECOWAS sub-region, Nnanna, Essien, Onwioduokit and Adamgbe (2007) using a gravity model for the second West African Monetary Zone (WAMZ) find that intra-regional trade would increase by 13.3 percent due to the cumulative impact of market size after controlling the impact of economic and monetary integration with some instruments. World

[5] Rose (2000) predicts that monetary union would raise trade interaction by more than three times.

Bank (2008) also reports that globalization has enhanced the spate of intra-regional trade in the sub-Saharan African region. Although the result corroborate the expectations of the authorities, the finding of Masson and Pattillo (2005) in a comparative study for African countries indicates that monetary union would increase trade between countries in Africa by a very negligible amount. The result suggests that actual trade could be greater than potential trade as well as trade within and between the countries in Africa. They, however, admit that trade has increased substantially among countries of the WAEMU zone and inter-regional trade between the CAEMU and the WAEMU zones (Debrun, Masson and Pattillo, 2010).

Nnanna *et al.* (2007) focusing on the trade effects of monetary union also calculated the loss in transaction costs and exchange rate risk in WAMZ utilizing data from the West African Monetary Agency (WAMA). They report that the cost of transaction arising from exchange rate losses would decline by US$34 for every one thousand dollar worth of transaction in the zone. Similar prediction was made by Ogunkola (2005) using the value of intra-regional trade that passed through WAMA. It reveals that despite the substantial number of transactions involved in the use of foreign exchange, only a small fraction of intra-ECOWAS trade was channeled through the Agency. A major caveat with this approach is that it does not portend a reliable and standard method for analyzing the effects of monetary integration on intra-regional trade.

Financial integration also generates several widely accepted benefits such as the improved allocation of capital, higher efficiency and higher economic growth (Mongelli, 2005; Kronberger, 2004 and Ogunleye, 2007). As pointed out by Mongelli (2010), the launch of the euro has brought about a significant deepening of financial integration, albeit unevenly across financial market segments. Although the earlier common view is that financial integration is lower among European countries than among US States, financial deregulation and liberalization brought in by monetary integration have further declined the cost of equity capital and bond financing in Europe, thereby enhancing market efficiency among European economies (Mongelli, 2002, 2010). Ogunleye (2007) found a marginal positive impact of financial globalization on growth in Sub-Sahara African (SSA) countries. The result nevertheless, traced about 99 percent impact of growth to financial openness used to proxy globalization for Nigeria evidence due to the influence of foreign private investment. In the case of WAMZ, Nnanna, *et al.,* (2007) reported a cumulate negative 4.172 basic points of financial indicator on growth. The

result reveals that credit to private sector and interest rate differential have negligible impact of -0.147 and -0.255 percentage effects on growth as key indicators of financial development. They argue further that low capacity utilization in the zone is a critical factor to such imbalance but noted that other financial development index captured by the constant coefficient suggest evidence of financial development on growth. The constant coefficient captured about 26 percent influence on growth. Several studies have also showed evidence of low risk sharing as an index of financial integration across European zone due to monetary union (Backus, Kehoe and Kydland, 1992; Atkeson and Bayoumi, 1993; Bayoumi and Klin, 1997).

However, Kronberger (2004) focused on the growth effects of monetary union in the MERCUSOR countries. He reveals that monetary unification impacts on growth through the network effect of improved capital efficiency. Similarly, Nnanna *et al.* (2007) in a panel study for WAMZ report that 26 percent point to WAMZ GDP is derivable from the financial efficiency variables. Financial efficiency or development is largely dependent on the prevalence of the proposed monetary union through the convergence of monetary policy stance. The result indicates that increase in credit to private sector due to monetary integration plays a significant impact on growth as Ogunleye (2007) points. The result, however, could not ascertain the individual country benefits from monetary integration.

Masson and Pattillo (2001), Debrun, Masson and Pattillo (2005, 2010) examined the impact of monetary union on inflation. They find fiscal financing need as a critical factor that underpins inflation in the sub-Saharan African which indirectly implies that giving up monetary autonomy through an independent regional central bank can act as an agency of restraint (Collier, 1991 and Baldwin, 1998). Debrun *et al.* (2005) predict that monetary unification would help to achieve low inflation. It argues that monetary union restrains monetary authority from financing fiscal deficit that manifest inflation. Further evidence suggests that output growth effect is another indicator of macroeconomic stability is expected to expand due to the other network effects of monetary unification in Africa.

There exist gaps in both the theoretical, methodological and empirical literature over the costs and benefits of monetary union particularly in the second West African monetary zone whose economic structure is relatively weak with long history of poor macroeconomic performances. First, existing OCA and the NOCA literatures did not clearly identify the key

elements of the cost of losing independent monetary policy instruments to the regional central bank as well as the expected benefits of joining monetary union. The divergences in methodology and determination of variables and benchmarks suggest that the subject matter have not been confronted with a valid, acceptable, robust and well informed methodology for estimating the costs and benefits of monetary integration. Thus, the mixed evidences offered in the literature are derivatives of the inconclusive evidences in both the theoretical framework and methodologies for estimating the costs and benefits of monetary union.

CHAPTER FOUR

THEORETICAL FRAMEWORK AND METHODOLOGY

Every empirical study rests on a theoretical framework, on a set of tentative hypotheses that the evidence is designed to test or to adumbrate...

(Milton Friedman, 1971)

This chapter is devoted to the discussion of the theoretical framework for this study. In addition, the methodology comprising the empirical models, the method of estimation, the key variables and sources of data are also contained in this section.

4.1 Theoretical framework

From theoretical perspective in the literature, there are basically three major cost elements of monetary union. The adoption of a common currency can be increasingly costly when the group of countries in a monetary union or potential partners witness shocks asymmetrically. Accordingly, asymmetric shocks stem from the nature of economic structure and characteristics of countries in a region which creates misalignment of stabilization policies in a monetary union. There are also costs due to the associated loss of exchange rate and independent monetary policy as domestic adjustment instruments a country gives up in joining a monetary union. The rationale is that the established supranational central bank takes charge of monetary policy for the integrating countries' while the integrating countries central banks acts as regional offices taking policy guide from the Common Central Bank (CCB). Monetary union may be very costly due to fiscal policy distortion from among member country(s) or potential partners of a monetary union or currency area. Financing fiscal deficits in principle is very restrictive and increasingly costly in a common monetary policy framework.

On the other hand, the benefits of a common currency include the trade creation effect, financial and capital market effects and the gains from policy coordination. Trade creation effect results from the reduction in transaction costs and exchange rate uncertainty associated with intra-regional trade. The deadweight loss due to conversion of currencies to a common numeraire and cost of processing information on exchange rate are lost to a single currency among members of a monetary union. Financial integration in the form of increased cross-border

financial flows (FDI, portfolio and equity capital flows), the law of one price and similarity in financial institutions and markets generate improved allocation of capital, higher efficiency of capital and higher economic growth. Monetary union and market integration can also provide a significant source of insurance against asymmetric shocks in the financial markets. Monetary union helps to achieve credible policy targets and macroeconomic stability through the network of externalities effects from policy coordination. The decision to adopt a single currency and common monetary policy framework provide refine institutional mechanism that strengthens central bank independence as a benefit for joining a monetary union.

Arising from the discussion in the literature, the optimum currency area[6] (OCA) theory by Mundell (1961) and the new optimum currency area theory associated with Frankel and Rose (1998), Beetsma and Bovenberg, (1998) and Debrun, Masson and Pattillo (2005) are the relevant theoretical constructs for the analysis of the costs and benefits of monetary union. Thus, both theories are chosen based on the plausibility of their assumptions which appear to be more systematic and relevant to WAMZ nations' economies. The optimum currency area emphasizes that when countries witness shocks symmetrically, exchange rate becomes unnecessary for domestic adjustment and a common currency becomes optimal for the countries in the region. Impliedly, if shocks are asymmetrically transmitted within the region, national exchange rates and monetary policy autonomy could be costly to lose. However, the theoretical doctrine of the new optimum currency area assumes that monetary unification enhances intra-regional trade and correlation of income which leads to the symmetry of shocks and correlation of business cycles. The above assumptions offer classical insights and link with the discussion of the costs and benefits of monetary union provided in the literature review.

From received wisdom in the literature, the two baseline theories appear separately inadequate and insufficient to demonstrate a richer and robust theoretical analysis of the costs and benefits of giving up monetary policy autonomy. At best, they could provide a sufficient appropriate theoretical paradigm under a hybrid framework. Therefore, this study developed a hybrid theoretical framework to formulate a comprehensive and integrated framework for the

[6] Optimum currency area is referred to here as costs of monetary union and not as optimum currency area criteria offered by Mundell, (1961), McKinnon, (1963) and Kenen, (1969).

analysis of the costs and benefits of forming a monetary union in WAMZ. Following the observed defects of these theories in the literature, we make some modifications of the assumptions vis-à-vis (shock criteria and integration effects) to reflect the character of the second West African monetary zone and to correct the gaps in the literature.

The theoretical underpinning of the modified (hybrid) framework is anchored on the following assumptions. The first principal assumption is that in WAMZ, cost relates to two major shocks, output shocks and fiscal policy distortion (Debrun, *et al*. 2005 and Hefeker, 2008). Asymmetric shock in output implies large adjustment cost to monetary union and is assumed to originate from the same process with terms of trade shock (Bayoumi and Eichengreen, 1992 and WAMI, 2005). Debrun, *et al.* (2005) stressed that the member countries of the second West African monetary zone face shocks asymmetrically due to differences in their terms of trade. In order words, variation in the terms of trade influences output shocks of the region. Thus, the prevalent of this kind of asymmetric shock could make monetary union in the zone costly because exchange rates required for domestic adjustments are no longer a handy policy instrument in this arrangement. Therefore, the economic intuition derivable from this framework is that the extent to which asymmetric shock could imply a larger adjustment cost to monetary union depends on the effectiveness and efficiency of exchange rate as instrument of adjustment (Ricci, 2008).

Second, we assume that fiscal policy shock arises from sub-optimal interaction between fiscal and monetary policies which make joining a monetary union costly. The economies in the second West African monetary zone suffers institutional problem between fiscal and monetary policy interaction. Since monetary liability is often used to augment fiscal policy, loss of monetary policy could be very costly. The financing of the fiscal deficits of the fiscal sector often makes monetary union difficult to sustain. Third, the new or endogenous optimum currency area theory is dynamic in nature such that monetary integration of the zone is assumed to influence trade and other macroeconomic variables positively. Given this exposition, the hybrid theoretical framework is presented subsequently.

4.1.1 The Costs of Monetary Union

Asymmetric Shocks

From the optimum currency area views, asymmetric shocks are assumed to originate from terms of trade, output, productivity and fiscal-political distortion (Bayoumi and Eichengreen, 1992; Kronberger, 2004; and Debrun, Masson and Pattillo, 2005).

$$\xi_r = \varepsilon i + (y - \bar{y}) + ky^2 + \Psi_i \qquad 4.1$$

Where: ξ is asymmetric shocks, εi is the terms of trade shock, $(y - \bar{y})$ is the output shock, and ky^2 and Ψ are the productivity and fiscal policy distortion respectively in equation 4.2.1. However, two major shocks, terms of trade shock and fiscal policy distortion are critical to this theory due to the peculiarity of WAMZ nations (see, Debrun, *et al.* 2005 and Hefeker, 2008). Secondly, the terms of trade shock is assumed to originate from the same process with output shock (Bayoumi and Eichengreen, 1992; Frankel and Rose, 1998 and Ricci, 2008). Therefore, we decompose equation 4.1 into two sub-elements: asymmetric shock to output and fiscal-monetary policy shocks that stem from fiscal and monetary policy interaction.

From the theoretical background, it is reasonable to conclude that asymmetric shock generally is aligned to the criteria of the optimum currency area. However, we modify this and assume that asymmetric shock determines the extent of cost of joining a monetary union. It is naturally assumed that output shocks and its response mechanisms are major indication of the costs to monetary union (WAMI, 2005). Following Bayoumi and Eichengreen (1992), output shock is expressed as;

$$\xi = \Delta y_t \qquad 4.2$$

The framework in equation 4.2 implies that the nature of shock depends on the pattern of changes in output among members which is largely driven by a number of factors depending on peculiarity of regions. Debrun, *et al.* (2005) stressed that the member countries of the second West African monetary zone face shocks asymmetrically due to differences in their terms of trade. In order words, variation in the terms of trade influences output shocks of the region. Thus, the prevalent of this kind of asymmetric shock could make monetary union in the zone costly

because exchange rates required for domestic adjustments are no longer a handy policy instrument in this arrangement. Therefore, the economic intuition derivable from this framework is that the extent to which asymmetric shock could imply a larger adjustment cost to monetary union depends on the effectiveness and efficiency of exchange rate as instrument of adjustment (Ricci, 2008). If a region witnesses' shocks asymmetrically, exchange rate may become critical to lose. Thus, we assume that the nature of exchange rate response to asymmetric shock in terms of trade is important in determining cost of monetary union in WAMZ. Since output is written in first difference form, this implies that the cumulative effects of shocks on the changes in output (terms of trade) must be zero (Bayoumi and Eichengreen, 1992).

$$\sum_{i=0}^{\infty} \Delta y_t = 0 \qquad 4.3$$

Fiscal and Monetary Policy Condition and Interaction

In the mainstream economic analysis, fiscal and monetary policies are two critical policy instruments required to provide policy direction in any economic state. From the OCA perspective, monetary unification leads to loss of independent monetary policy while the participating countries still have power over fiscal policy. Fiscal policy distortions also make monetary union increasingly costly. Following Debrun, Masson and Pattillo (2005), we make the important assumption that distortion created by the fiscal sector is financed by the monetary sector. In monetary union framework, national central banks lose the power to finance this distortion which makes it costly to join a monetary zone or currency area. Hence, in modeling this, we assume that there are two sectors; the fiscal and the monetary policy institutions. The fiscal authority is concerned with revenue generation and expenditure while the monetary authority is in charge of the regulation and control of money supply. This fiscal-monetary policy interaction framework follows Blanchard and Fischer (1989) and Visser (2005) and presented below;

Fiscal Sector

In modeling the fiscal sector, fiscal policy is characterized by the interplay between tax revenue, seigniorage revenues and government expenditure which is set exogenously (Debrun, *et al.* 2005).

Revenue Function

Government revenue function provides wedge for its constraint expenditure. The revenue function is obtained by modifying the government budget constraint in equation 3.10 as;

$$R = \tau_i + m/p \qquad 4.4$$

Where, government generates revenue[7] R, through tax τ_i and seigniorage revenue from money creation m/p. It is implied that tax revenues are insufficient thus; money is created to ensure primary budget balance (Blanchard and Fischer, 1989; Easterly, 1999 and Hefeker, 2008).

Expenditure Function

$$E = \bar{G} \qquad 4.5$$

Equation 4.5 is the total government expenditure G assumed as exogenous under Keynesian hypothesis.

Balance Budget Condition

$$R = E \qquad 4.6$$

The balance budget condition in equation 4.6 may be optimal under two conditions; when government revenues and expenditures are equal and under an efficient fiscal monetary policy interaction. However, the economies of WAMZ are assumed to have inefficient fiscal system that creates distortion for monetary policy management (Debrun, *et al*. 2005). This is accounted for explicitly in the model by modifying equation 4.5 as;

$$E = g_i + \psi_i \qquad 4.7$$

Where, ψ_i in equation 4.7 is the distortion in fiscal policy which increases the scope of government expenditure. This fiscal policy distortion is assumed equal to the seigniorage or

[7] Revenue function in the case of Nigeria includes oil revenue, tax and seigniorage revenue.

money borrowed from the central bank in financing fiscal deficit as contained in equation 4.4 (see, Debrun, *et al.* 2005).

$$\psi_i = E - R \qquad >0 \qquad 4.8$$

Equation 4.8 shows that government expenditure is higher than the revenue stream, which leads to fiscal deficit. The overall analysis is that deficit financing and changes in money supply influence the rate of inflation in equation 4.9 and 4.13.

$$\pi = \Delta M + \psi F \qquad 4.9$$

Monetary Sector

Theoretically, the monetary sector is characterized by the interaction between money demand and money supply in the money market. Both are influenced by some mechanisms in the market. Following Blanchard and Fischer (1989), money demand and money supply is linked as;

Money Demand Function

$$\frac{M^D}{P} = \eta Y + \varphi r \qquad 4.10$$

Equation 4.10 indicates that real money demand is determined by the level of income y and interest rate r. An increase in income and a decrease in interest rate influence real money balances.

Money Supply Function

$$M^s = \frac{\bar{M}^s}{P} \qquad 4.11$$

Equation 4.11 money supply M^S is assumed to be exogenously determined by the monetary authority.

Equilibrium Condition in the Money Market

$$M^D = M^S \Rightarrow = \frac{M^D}{P} = M^s = \frac{\bar{M}^s}{P} \qquad 4.12$$

Following Visser (2005), real money supply in equation 4.12 is modified to corroborate equation 3.8 ($s = \theta m_t + \pi m_t$) in accounting for the effects of deficit financing as;

$$M^S = \frac{\bar{M}^S}{P} + \Psi_i \qquad 4.13$$

Hence, the new equilibrium monetary condition is stated as;

$$\frac{M^D}{P} = \frac{\bar{M}^S}{P} + \Psi_i \qquad 4.14$$

Equation 4.14 is consistent with Blanchard and Fischer (1988) debt financing models and indicates that borrowing from central bank to finance fiscal deficit increases money supply mechanism which leads to inflation. The parameter ψ_i represents the degree of this distortion in monetary policy management. Thus, the long-run equilibrium between the two sectors (fiscal and monetary authorities) implies that;

$$\Theta \equiv Fs^{\Psi_i} = Ms^{\Psi_i} = 0 \qquad 4.15$$

Equation 4.2.16 indicates that the excess spending of the fiscal authorities (*Fs*) is equal to the money created by the central bank (*Ms*) in financing deficits (Hefeker, 2008). The implication is that joining monetary union results in the loss of this financing instrument but could provide the benefit of reduced inflation. The cost of losing this policy handle may be higher for countries with greater financing needs as well as those that rely heavily on seigniorage revenue. Fiscal deficit and financing mechanism, therefore, are important elements in determining how much countries' have effectively and efficiently managed their economies and the basis for adjudging the net-benefit of giving up the monetary policy instruments to the regional central bank (Debrun, *et al*. 2005).

4.1.2 Benefits of Monetary Union

Drawing from the new optimum currency area theory, monetary union enhances trade, financial and capital market integration. It stimulates and expands activities since economic agents may seek high risk investment across the shores of their economies when a country joins economic and monetary union. Monetary union also generates gains from policy coordination among members of the integrating countries.

Trade Creation[8] Effects

Intra-regional trade increases as exchange rate become more stable, with increase population (market size) and output due to openness of economies. Following Frankel and Rose (1998) and Nnanna *et al.* (2007), the trade creation effect of monetary integration is extended from the transformation of the augmented gravity theory of trade in equation 3.12 and expressed as;

$$W_{it} = \dot{e}(X_{ijt} + M_{ijt})/(Y_{i,t} + Y_{j,t}) \qquad 4.16$$

$e = p = p^*$ (The law of purchasing power parity) and $W_{it}\Theta\bar{\xi}$

Equation 4.16 is based on the standard augmented gravity theory. The W_{it} represents the welfare effect of trade integration, e is the common exchange rate, while X_{ij}, M_{ij} and Y_{ijt} are export, import and output interaction among members. For further theoretical transformation of the gravity theory (see, Anyanwu, 2003 and Nnanna, *et al*. 2007).

[8] Monetary unification produces change in the trade structure vis-à-vis trade creation and trade divergence Vina (1950)

Financial and Capital Market Effect

The effect of monetary integration on the capital and financial markets is anchored on the capital efficiency and growth nexus of Pagano (1993) as applied by Nnanna, *et al.* (2007). The idea is that it is difficult to develop direct consequences of financial integration through other frameworks or channels like interest rate convergence, lower risk sharing and reduced volatility given that their strength in the literature and in the zone is weak and small. More also, in developing and emerging market economies such as WAMZ, banks play important role in the financial sector, because of the absence or weakness of equity or bond markets. Following Pagano (1993) and Obiora (2007), we assume that monetary integration impresses on the capital market which makes it more effective and efficient. This efficiency in capital induces growth in these economies. This study therefore leans on the capital efficiency growth framework that is anchored on the endogenous growth theory. The endogenous growth theory demonstrates a theoretical link between capital efficiency and economic growth. This framework follows the theoretical view as contained in equation 3.13 to 3.16) and presented as;

$$CF = f(FI) \qquad 4.17$$

Where CF captures capital efficiency and FI is financial integration. Equation 4.17 assumes that aggregate output is a linear function of the aggregate capital stock. The rationale is that capital efficiency impacts on economic growth through the neoclassical growth channel as;

$$y_t = Ak_t \qquad 4.18$$

where y_t in equation 4.18, represents growth variable and k_t is the capital stock at time t. Returns to scale are constant and returns to capital are not diminishing. Only a single good is produced which can be either consumed or invested. The invested good faces a rate of depreciation δ. Then gross investment can be written as;

$$I_t = k_{t+1} - (1-\delta)k_{t+1} \qquad 4.19$$

Equation 4.19 indicates that gross investment I_t is equal to the change in capital stock K_t over time. As indicated above financial agents keep a fraction of savings μ for their intermediation activities. The saving-investment equation becomes

$$\mu S_t = I_t, 0 < \mu < 1 \qquad 4.20$$

The steady-state growth rate takes the form

$$g = A\frac{1}{y} - \delta = A\mu S - \delta \qquad 4.21$$

As in the case with endogenous growth models with perfect competition, the equilibrium growth rate depends on preference parameters and technology. The higher the level of capital efficiency, A, the faster is the growth rate. Thus, the growth rate could also be high if the rate of capital depreciation δ is low.

Policy Coordination Effect

The new OCA theory suggests that monetary union serves as a pivot for addressing time-inconsistency problem by removing policy discretion. Price stability is modeled as the best indicator of macroeconomic stability. Following Beetsma and Bovenberg, (1998), monetary union influences policy credibility which underpins inflation. This makes the reactionary function of inflation differ in both monetary union and policy autonomy. According to Hefeker (2008) inflation reaction/loss function under monetary policy autonomy is specified as;

$$\pi = \frac{\pi^e + (y^*_i - \bar{y}_i) + \psi_i}{1+\theta} \qquad 4.22$$

Equation 4.22 indicates that domestic inflation is responsive to expected inflation, output shock, fiscal deficit and money creation. However, through rules and policy discipline anchored on game strategy (policy coordination) between the authorities, monetary union impacts by reducing inflation and increasing output. Therefore, the reaction function for inflation under monetary union as stated in equation 3.22 is written as,

$$\pi = \left(\frac{1}{\alpha_{\pi M} + 1}\right)\left(\pi^e + \frac{1}{n}\sum_{i=1} n\left(\tau_i + \tilde{x}\right)\right), \qquad 4.23$$

Where, the CCB inflation is responsive to the common central bank monetary policy action and the individual government tax and spending objectives (see, Beetsma and Bovenberg, 1998;

Dixit and Lambertini, 2001). The institutional mechanism of a common monetary policy underpins inflation and positively on output. This results into equation 4.24.

$$\pi^{\otimes} = \Theta(y - \pi^{2}) \qquad 4.24$$

At equilibrium, the overall benefit of monetary integration is compared with the cost of losing autonomous financing instrument as shown in equation 4.25.

$$\dot{e}^{\frac{\bar{\xi} y \pi^{\otimes}}{\sum_{i \neq j}^{n} \Omega}} - \delta\psi \qquad 4.25$$

4.2 Methodology

4.2.1. Model Specification

From the theoretical literature review, the key elements of costs and benefits of losing independent monetary autonomy to the regional central bank have been identified. Following from the theoretical framework the models are specified below;

The Cost Models;

$$C = f(AS, LS, FPD) \quad 4.26$$

Where, AS represents asymmetric shocks, LS is loss of seigniorage, and FPD captures fiscal policy distortion. Equation 4.26 is decomposed into behavioural models that capture the various elements of cost. These models are presented as;

Asymmetric Shock Model

The asymmetric shock model is derived from WAMI (2005) and Debrun, Masson and Pattillo (2005) frameworks. However, our approach contrasts with these authors in two ways; the process of generating shocks and the variables used are sufficiently different. In the literature, asymmetries in output of WAMZ nations originates from terms of trade shocks and terms of trade bears a closer link with exchange rate variation (Obstfeld and Rogoff, 1995). Ricci (2008) stressed that the degree to which asymmetric shocks implies a large cost to a currency union depends on the effectiveness of exchange rate as an instrument of short-run adjustment. It implies that asymmetric shocks make exchange rate a costly instrument to lose. Following the findings of Debrun, et al (2005) and WAMI (2005) on the prevalence of asymmetric shock to the terms of trade, this is preceded by examining the response of exchange rate to terms of trade shock to evaluate the cost implication of asymmetry shocks in WAMZ. Therefore, the model is anchored on the structural variance decomposition vector autoregressive VAR framework developed by Sim (1980) and Bayoumi and Eichengreen (1992) expressed as;

$$\Delta Y_t = \alpha_0 + \sum_{i=1}^{k} \alpha_i \Delta X_{t-1} + \sum_{i=1}^{k} b_j \Delta Y_{t-j} + v_t \quad 4.27$$

$$\Delta X_t = \alpha_0 + \sum_{i=1}^{k} \alpha_i \Delta Y_{t-1} + \sum_{i=1}^{k} b_j \Delta X_{t-j} + v_t$$

Where Y_t represents exchange rate and X_t is the term of trade shock TOT .The procedure starts with generating the shock by regressing each variable to its own lagged values and the lagged values of the other taking the error terms as shocks ($X_t = B_1 X_{t-1} + B_2 X_{t-2} + ... + B_n X_{t-n} + e_t$ in the form of the Bayoumi and Eichengreen, 1992 method in equation 3.26) . The second step is to examine the nature of the response of exchange rate to the terms of trade shock through the variance decomposition technique. The idea is that if asymmetric shock prevails, it will be costly to lose exchange rate for domestic adjustment. Thus, the higher the degree of response of exchange rate to terms of trade shock, the more costly to adopt a common currency. This approach is consistent with WAMI (2005).

Loss of Seigniorage Model

The model for the loss of independent monetary policy leaned on the seigniorage model of World Bank (1994), Masson and Pattillo, (2001) and Ogunkola (2005). The model calculates the changes in the monetary base multiplied by the growth rate of output and the ratio of money supply over income. However, our seigniorage model is modified to account for the determinants of seigniorage in WAMZ countries. The rationale is to relate seigniorage as an alternative financing instrument due to the weak institutional and poor political factors in the sub-region as established in our theoretical framework. The consequence of this is that joining monetary union would relief these countries the opportunity of relying on this policy handle or instrument. Following Aisen and Veiga (2005), our seigniorage model is specified as:

$$MR/GDP = \alpha_1 + \alpha_2 GR/GDP + \alpha_3 OPNS + \alpha_4 GDPPC + \alpha_5 PD/GDP + \alpha_6 EXP/GDP + \varepsilon \qquad 4.28$$

Where;

MR/GDP = Money reserve to GDP used to capture money creation[9].

GR/GDP = Government revenue to gross domestic product.

[9] Change in money base as defined by Aisen and Veiga (2005).

PD/GDP = Public domestic debt to gross domestic product.

$OPNS$ = Openness of the economy.

$GDPGR$ = Growth rate of gross domestic product per capita.

EXP/GDP = Government expenditure to gross domestic product and

ε = The stochastic error term that accounts for other unexplained factors in the model.

In terms of our a priori expectations, it is theoretically established that higher revenue to GDP ratio and the high degree of openness to trade may reduce the need and reliance on reserve money creation. However, the higher the level of debt to GDP reflecting weak tax base, rising government expenditure and low level of development capture by the growth rate of GDP per capita are expected to bring about increase in the demand for money creation especially in developing countries like WAMZ (Aisen and Veiga, 2005). In the same vein, the more costly it is to give up independent monetary policies to monetary unification of the region.

Fiscal Policy Distortion Model

The model for fiscal policy distortion is developed to account for the costs associated with fiscal deficit financing in a monetary union. The model leans on the revenue model of Debrun, Masson and Pattillo (2010). However, we modify the model to express fiscal deficit financing as a function of its influential variables. The reason is that the DMP model does not directly capture fiscal deficit. It is assumed that government finances fiscal deficit to ensure that primary balance is achieved. This model is specified as;

$$CG/GDP = \chi_1 + \chi_2 MR/GDP + \chi_3 FD/GDP + \chi_4 CAB/GDP + \chi_5 PD/GDP + \varepsilon \qquad 4.29$$

Where;

CG/GDP = Domestic credit to the government sector used to capture deficit financing.

FD/GDP = Fiscal deficit to GDP ratio.

MR/GDP = Money reserve to GDP as a measure of money creation.

CAB/GDP = Current account balance.

PD/GDP = Public debt to GDP.

As explained in the theoretical literature, the higher the level of fiscal deficit the more government increase domestic credit to ensure primary balance. Money reserve is assumed to positively influence credit financing particularly in WAMZ. Money reserve is a major component of broad money supply and the higher the availability of money, the more dispose central banks may be in financing deficits. Adverse current account balance is also expected to maintain a negative relationship with financing to ensure internal and external balances under the a priori expectation. Similarly, domestic public debt has a positive relationship with domestic credit. Overall, the implication is that the more these variables influence credit financing, the more costly it may be to establish a monetary union with countries with poor fiscal operation records.

The Benefit Models

Following from the theoretical framework, the three elements of benefits of monetary union are trade creation, financial integration effects and policy coordination gains. The choice of these elements is influenced by similar studies that sought to estimate the benefits of monetary union Nnanna *et al.,* (2007), Kronberger, (2004) and Debrun, Masson and Pattillo (2010). The generic model is specified as;

$$B = f(TC, FI, PC) \qquad 4.30$$

Where, B is the total benefit, TC is trade creation, FI represents financial integration effects and PC is the policy coordination gains. Equation 4.30 is decomposed into three behavioural models to estimate each of the elements. This is presented below.

Trade Creation Effect

The trade creation effect leans on the augmented gravity model of Nnanna *et al.,* (2007). The gravity model takes into consideration the effects of economic and political barriers on international trade such that when these factors are endogenized, they increase intra-regional trade. Gravity model is highly flexible and takes care of the specific character of any region or

zone. This model is consistent with several studies that sought to model the impact of monetary integration on trade in EMU, CFA, SADC and WAMZ economies (see Emerson, *et al.* 1992; Anyanwu, 2003 and Nnanna, *et al*. 2007). The model specified as:

$$TF = \theta_1 + \theta_2 GDPs + \theta_3 OPNS + \theta_4 POP + \theta_5 TF_{-1} + \varepsilon_i \qquad 4.31$$

$$\theta_2, \theta_3, \theta_4, \theta_5 \succ 0$$

Where;

TF = The trade flow variable measured as total exports plus total imports.

GDPs = Gross domestic product which captures the market sizes of the integrating countries.

OPNS = Openness of the economy defined as trade flow as a ratio of GDP.

POP = Population

Generally, these variables are used to dummy for the effect of economic and monetary integration. They are expected to significantly and positively influence trade under the simplified assumptions earlier stated in the theoretical review.

Financial and Capital Integration Effect

The capital and financial integration model of this study is consistent with the capital efficiency framework of Pagano (1988) and Nnanna *et al.* (2007). Financial integration helps to improve capital efficiency which impacts directly on economic growth. In the WAMZ nation's economies, domestic financial markets are relatively not well developed but cross-border financial flow facilitates economic growth. Following Nnanna *et al.* (2007), capital efficiency model is specified as:

$$g = \lambda + \gamma_i Y + \eta_i Z + \varepsilon_i \qquad 4.32$$

$$Y = \varphi_1 + \varphi_2 CPS + \varphi_3 ITS \qquad 4.33$$

$$Z = \phi_1 + \phi_2 ER + \phi_3 IR \qquad 4.34$$

$\varphi_2 \succ 0, \varphi_3 \prec 0, \phi_2 \succ 0$ and $\phi_3 \prec 0$

Capital efficiency is measured by a vector of financial development variables Y and control variables Z , respectively.

Where;

g = Real growth rate of output.

Y = Credit to private sector (CPS) and interest rate differential between lending and deposit rates (ITS) used as financial development variables.

Z= Exchange rate (ER) and inflation (IR), the control variables are which capture the mechanism through which financial variables impact on growth. It is theoretically expected that these variables would have positive relationship with economic growth.

Gains from Policy Coordination

The gains of policy coordination associated with joining a monetary union is anchored on the price stability model. To estimate the effect of monetary union on inflation, we adopt the model of Debrun, Masson and Pattillo (2010) based on the ability of monetary union to curtail national government spending. Inflation is expressed as a function of the average financing needs and the amount of intra-union trade. The rationale is that monetary union would influence the spending pattern of members through improved fiscal-monetary interaction (see Dixit and Lambertini, (2001). In addition, inflation would be contained by the efficient trade interaction (openness) due to stable exchange rate. The price stability model is stated below:

$$\pi = \gamma_1 + \gamma_2 FN + \gamma_3 \theta_{A,i} + \varepsilon \qquad 4.35$$

$\gamma_2 \prec 0,$ and $\gamma_3 \succ 0,$

Where;

$\pi,$ = Inflation rate

FN =Financing needs (government expenditure).

$\theta_{A,i}$ =Trade flow variable (openness).

4.2.2 Net-Benefit of Monetary union

$$NB_i = B_i - C_i \tag{4.36}$$

Where i represent individual country evidence in the union.

$$NB_i = (b_1 TI + b_2 FI + b_3 PC) - (c_1 AS + c_2 LS + c_3 FPD) \tag{4.37}$$

$$NB_i = \sum_i \omega_i (b_i) - \sum_i \omega_i (c_i) \qquad b_i > 0 \; ; \; c_i \succ 0 \tag{4.38}$$

For the union we have;

$$NB_{it} = (b_{1it} TC + b_{2it} FI + b_{3it} PC) - (c_{1it} AS + c_{2it} LS + c_{3it} FPD) \tag{4.39}$$

$$NB_{mu} = \sum_{mu}^{n} \omega_i b_i - \sum_{mu}^{n} \omega_i c_i \qquad b_{imu} > 0 \; ; \; c_{imu} \succ 0 \; , \qquad i = 1, ..., n \tag{4.40}$$

Where; i takes care of the cross-sectional units in the union.

4.2.3 Computation of Composite Index of Net-Benefit

1. The computation process begins with regressing the various behavioural equations of the costs and benefits of monetary union. This enables us to obtain parameter estimates and coefficients for the regressors, which would be used to calculate the relative weights.

2. The estimated coefficients will be used to capture the relative weights of each variable on both the cost and benefits. The relative weights are obtained as:

$$weight(w_i) = \frac{\hat{\beta}_1}{\sum_{i=1}^{j} \hat{\beta}} \; ; \quad j = 1, ...k \text{ (no. of variables) and } i = 1, ...n \text{ (no. of countries).}$$

3 To obtain weighted indexes that is additive, we normalized the weights by multiplying the weight of the (significant) variables by the series (standardized data) and then sum up to derive the index of each indicator as;

$\hat{B} = \sum w(b_i) * X_{it}$ and $\hat{C} = \sum w(c_i) * X_{it}$; for each indicators as a policy mix, where X are the variables used to compute the composite policy variables.

4. The overall index of the benefit and cost indicators of joining a monetary union is then obtain as Weight $(w_i)\, B_i = \sum_i \omega_i(b_i) \equiv b_1 + b_2 +, \ldots + b_n$ and $(w_i) C_i = \sum_i w_i(c_i) \equiv c_1 + c_2 +, \ldots + c_n$

5. A comparison between the costs and benefits would be made and inferences drawn on the weighted averages of both.

4.2.4 Description of Key Variables and Measurement

Seigniorage: This is defined as the revenue generated from money creation by the central bank. It is assumed that most countries in WAMZ rely on this policy handle in financing budget deficit, a corollary of insufficient revenue from their weak tax base. As a critical instrument to the central banks, it is intended to determine how much this constitutes as a proportion of money supply in the country since the decision to join a monetary union would imply losing this costly instrument.

Money Reserve: This is defined as the change in monetary base. It is used to measure the degree of money creation by the monetary authorities (Aisen and Viega, 2005). This is in line with the IFS line 14a.

Terms of Trade: The ratio at which a country can trade domestic products for imported products (Iyoha and Unugbro, 2002). It is measured as the index prices of exports to imports. It is the ratio of export or domestic price index to the import price.

Exchange Rate Variation: This is defined as the change in real exchange rate overtime. It is computed from exchange rate, which is the price of one currency in terms of another usually measured in US dollars. Exchange rate is derived from the IMF financial statistics.

Fiscal Deficit to GDP: This is the ratio of fiscal deficit to the gross domestic product. Fiscal deficit is defined as the excess of fiscal expenditure over fiscal revenue. The concept is used to determine the proportion of fiscal deficit as a percentage of the gross domestic product.

Credit to Government: This is simply regarded as the amount of money borrowed by the government from the central bank. Governments usually use this money to finance its expenditure. It is assumed that if the credit to the government as a percentage of GDP is high, it does suggest that such country incurs huge debts and rely so much on borrowing for financing of deficits.

Openness: This is defined as the ratio of total exports and Imports to GDP. It is used as an indicator in measuring the level of trade integration (World Bank, 2008).

Interest Rate Spread: This is the difference between lending rate and deposit rate. It is used to measure the level of convergence of interest rate as a critical index of financial integration or deepening.

4.2.5 Data Sources

This study utilized annual secondary data from a number of agencies and sources. These include the various central banks, West African Monetary Agency (WAMA), West African Monetary Institute (WAMI), African Development Bank Indicators, the IMF financial Statistics and Direction of Trade Statistics (CD-ROM, 2010) and the World Bank development indicator. However, to enhance the data quality, the study specifically relies on the IMF and World Bank to keep data in the same scale and maintain internal consistency. More also, the variables were divided by the gross domestic product of each country as a measure of their economic size to permit informed comparison. The variables are money supply, seigniorage revenue, credit to government and private sector, domestic public debt, current account balance, exchange rate, terms of trade, gross domestic product, inflation, budget/fiscal deficit, terms of trade, exports, imports and openness.

4.2.6 Estimation Techniques and Procedure

Tests of the time series behaviour of the variables were carried out first to avoid spurious results (Gujarati, 2005). The cost elements are evaluated on the premise of evaluating the performance of the existing data of the selected indicators while the benefit elements are built on the influence of the prevailing financial integration and globalization in the economies of the proposed monetary zone (Mongelli, 2010; Madhur, 2002; Debrun, Masson and Pattillo, 2005 and Nnanna, *et al.* 2007).

The Ordinary Least Square (OLS) technique and the Error Correction Model (ECM) were used to estimate the individual country models. The choice of these techniques are influenced by three factors; the linear nature of our model specification, the ability to give parameter estimates that are best, linear, unbiased and efficient estimators and the behaviour of the time series data.

In the case of the union, panel data analysis is adopted with matrix notation stated as;

$$y_{it} = \alpha + x_{it}^{1}\beta + u_{it} \quad , \qquad i = 1,...,N; \quad t = 1,...,T \text{ and } u_{it} \bigcup IID(0, \sigma^2 v) \qquad 4.41$$

Where the α represents unknown parameters jointly estimated with β while i and t denote the cross-section dimension and time-series dimension. The $x's$ are the variables for estimation as the v_{it} accounts for the stochastic disturbance component of the fixed error term that is independent and identically distributed. The study also developed indices from the parameter estimates of the behavioural models to compare the costs and benefits of the second monetary union in West Africa and to determine the net-benefit. This enabled us to make inference at both the individual country levels as well as the union level.

Finally, the VAR method was employed to determine the degree of response of exchange rate to the terms of trade shock as a basis for establishing the costs associated with asymmetric shock. The procedure started by first deriving the shocks through regressing the residual of the terms of trade and then tracing the response of exchange rate through variance decomposition mechanism. The choice was influenced by the fact that when measuring shocks variation and transmission, VAR method remains the best technique as evident in the various studies that have utilized the technique (see, Bayoumi and Eichengreen, 1992; Ogunkola, 2005 and WAMI, 2005).

CHAPTER FIVE

RESULTS AND DISCUSSION

This chapter covers the presentation and discussion of the empirical results. The chapter starts with the examination of the statistical and stationarity properties of the data through diagnostic tests. Subsequently, the presentation of results and discussion of the behavioural cost and benefit models as well as the cost-benefit analysis of common currency for the second West African monetary union followed.

5.1 Data Diagnostics

5.1.1 Unit Root Test

In line with the recent developments in time series econometrics, the possibility of unit root in time series data was examined. The unit root test was accomplished using Argument-Dickey Fuller (ADF) test for the data across countries. Similarly, the panel unit root for the group was tested using the Levin, Lin Chu common unit root tests. Table 5.1 presents the unit root test results. The result of the unit root tests of the data reveals that most of the variables are stationary at levels I(0) while the ones that were not stationary at levels were differenced to their first order I(1) to make them stationary. In The Gambia, the variables that are stationary at levels include inflation rate, money reserve, government expenditure, public debt, current account balance, fiscal deficit to GDP, terms of trade, gross domestic product per capita, gross domestic product growth rate, and growth rate of credit to the private sector. Exchange rate, government revenue, openness, credit to the government, interest rate spread, population, the gross domestic product and trade flow were stationary at first difference.

In the case of Ghana, similar results were found. Some variables including money reserve, inflation rate, openness, domestic credit to government, gross domestic product per capita and growth rate of credit to private sector were stationary at level. However, terms of trade, exchange rate, government revenue to GDP, expenditure to GDP, public domestic debt to GDP, growth rate of gross domestic product, fiscal deficit to GDP, current account balance to GDP, trade flow, gross domestic product, population and interest rate spread were all stationary in their first difference at 5 percent levels (see, Table 5.1).

Table 5.1 Result of Unit Root Tests

Variables	Gambia		Ghana		Nigeria		Sierra/L		WAMZ
	ADF*		ADF*		ADF*		ADF*		LLC***
TOT	I(0)		I(1)		I(1)		I(0)		I(0)
EXCHRT	I(1)		I(1)		I(1)		I(1)		I(1)
MRGDP	I(0)		1(0)		I(0)		I(1)		I(0)
GRGDP	I(1)		I(1)		I(1)		I(1)		I(0)
EXPGDP	I(0)		I(1)		I(1)		I(0)		I(1)
CGGDP	I(1)		I(0)		I(1)		I(1)		I(1)
CABGDP	I(0)		I(1)		I(1)		I(0)		I(0)
PDGDP	I(0)		I(1)		I(1)		I(0)		I(1)
FDGDP	I(0)		I(1)		I(0)		I(0)		I(1)
OPNES	I(1)		I(0)		I(1)		I(0)		I(1)
GDP	1(1)		I(1)		I(1)		I(1)		I(1)
GDPPC	I(0)		I(0)		I(1)		I(1)		I(0)
GDPGR	I(0)		I(1)		I(0)		I(0)		I(0)
TFLO	I(1)		I(1)		I(1)		I(1)		I(1)
POP	I(1)		I(1)		I(1)		I(1)		I(1)
INFL	I(0)		I(0)		I(1)		I(1)		I(0)
GCPS	I(0)		I(0)		I(0)		I(0)		I(0)
ITS	I(1)		I(0)		I(1)		I(1)		I(1)

I (0) =Stationary at Level, **I(1) = Stationary at first difference.**

***Augmented Dickey-Fuller** ****Levin Lin and Chu Common unit root.**

The unit root test result in Table 5.1 for Nigeria, however, reveals that inflation, money reserve, the growth rate of GDP, growth rate of credit to private sector and fiscal deficit to GDP are stationary at levels while most of the variables are significant in their first difference. For instance, government revenue, government expenditure, public debt and credit to government, gross domestic product, gross domestic product per capita, interest rate spread, current account balance, openness, population, trade flow, terms of trade and exchange rate are stationary at first difference.

Evidence from Table 5.1 indicates also that terms of trade, expenditure to GDP, public debt to GDP, growth rate of gross domestic product, openness, fiscal deficit to GDP, and the growth rate credit to private sector were stationary at levels in Sierra Leone. Moreover, exchange rate, money reserve to GDP, gross domestic product per capita, credit to the government to GDP, inflation, interest rate spread, population, gross domestic product, trade flow and government revenue to GDP are stationary after first difference.

Moreover, the panel unit root test results for the group as shown in Table 5.1 indicates that terms of trade, government revenues, growth rate of GDP, current account balance, growth rate of credit to private sector, inflation, money reserve and gross domestic product per capita are stationary at levels. On the other hand, exchange rate, government expenditure, public debt, openness, credit to government, fiscal deficit to GDP, trade flow, GDP, population, and interest rate spread are stationary in their first difference of the Levin, Lin and Chu panel unit root test at 5 percent levels. The order of integration of the variables for the countries and the group is summarized in Table 5.1.

5.1.2 Cointegration Test Result

Given the scenario above and to avoid potential spuriousness of results emanating from non-stationarity of the data series as well as to analyze the short-run dynamic structure of the relationships, we proceeded to investigate whether there exists' long run relationship between and among the variables. The Johansen (1993) procedure for multivariate cointegration test was adopted for the purpose given its superiority over the Engel and Granger (1987) technique. Five behavioural models: loss of seigniorage, fiscal policy distortion, trade creation, financial integration effect and policy coordination gain equations were tested for cointegration in the four countries (The Gambia, Ghana, Nigeria and Sierra Leone).

The result of the Johansen cointegration tests based on the likelihood ratio (Trace) test are presented in appendix 11 for ease of appreciation given the large space requirement. The results reject the hypothesis of no cointegration indicating that long-run relationships exist among the variables for the tested equations. With respect to the seigniorage equation, the Trace statistics likelihood ratio shows 6 cointegrating equations for The Gambia and 2 for Ghana, Nigeria and Sierra Leone each out of the 6 cointegrating vectors. The fiscal policy distortion equation showed that the variables are cointegrated in The Gambia, Nigeria and Sierra Leone except Ghana with no cointegrating equation.

Moreover, the trade creation model equally rejects the hypothesis of no long-run relationship among the variables for all the countries. This indicates that a long-run relationship exist among the chosen macroeconomic variables. Similarly, the financial and capital efficiency model rejects evidence of no long-run relationship among the variables in Ghana, Nigeria and Sierra Leone while the policy coordination equation revealed that the variables are cointegrated in Ghana and Sierra Leone. The few caveats are the fiscal policy distortion equation for Ghana, financial and capital efficiency model for The Gambia and policy coordination equation for The Gambia and Nigeria with evidence of no long-run relationships. Thus, effort was intensified to adjust for this vis-à-vis the statistical properties (tests) of the data were carried out to determine the effects before carrying out the long-run estimation in the next section.

5.1.3 The Statistical Properties of the Variables

The statistical properties of the variables are discussed in this sub-section. It is worthy to mention that the variables used in this study were divided by gross domestic products of the participating countries as a measure of their sizes. More also, the variables were transformed to their standardized[10] form to provide us with a yardstick (standardized Beta coefficients) for comparing results or outcomes (Gujarati, 2008: 157). Therefore, ascertaining the statistical properties of the variables is imperative to inform the choice of econometric methodology. Thus, the univariate statistics of the variables which includes the mean, median, skewness, Jarque-Bera, Kurtosis among others were carried out for the countries. The mean, skewness, Kurtosis and Jarque-Bera tests are traditional standard tests used to establish the normality of variable(s).

Skewness is a measure of the symmetry of the histogram. The Jarque-Bera (JB) test of normality is a test of the joint hypothesis that skewness and kurtosis are 0 and 3 respectively. For any standardized normal variable Z, the rule of thumb is that both its mean value and skewness must be zero. Furthermore, the Jarque-Bera asymptotic test of normality, which is used to test for the probability of the OLS residuals, was also applied. The results of the descriptive statistics for the variables are presented in the appendix 1 due to space constraints.

The statistical property of the variables reveal that both the mean (first moment) and skewness (third moment) for most of the variables were either greater than or less than zero across the countries. Descriptive statistics results show that in most of the countries, skewness and kurtosis criteria were not satisfied (see appendix 1). Based on these outcomes, it can be directly deduced that most of the variables did not satisfy the standardized normal distribution. Therefore, we reject the null hypothesis that the variables are normally distributed. The econometric implication is that normality tests statistic such as t, F and R^2 may not be consequential for drawing statistical inferences about the probability of error terms. However, studies based on the standardized variable form do not place emphasis on the error term rather the point estimates (standardized beta coefficients) because it uses standard deviation as weights' for comparison in regression analysis (*ibid*). Thus, this is chosen because of our unique methodology (cost-benefit analysis) for this study.

[10] A variable is said to be standardized if we subtract the mean value from its individual values and divide the difference by the standard deviation of that variable. This keeps the mean at zero and its standard deviation one.

5.2 Estimates of Costs of Monetary Union

5.2.1 Asymmetric Shock

Table 5.2: Result of the Asymmetric Shock Model

	WAMZ	GAMBIA	GHANA	NIGERIA	SIERRA/L
DTOT(-1)	0.000	-0.00	-0.00	-0.00	-0.1
DTOT(-2)	0.08	0.03	-0.09	-0.01	-0.08

The asymmetric shock model results above are indicative. In the panel regression analysis, the result shows that a cholesky standard deviation shock in the terms of trade, on the average induces about 0. 08 percent impulse or innovations in exchange rate within two lag period. The degree of response of exchange rate to change in the term of trade as portrayed by the variance forecast error result is supported by the impulse response function in the appendix. The evidence provided by this result is not in consonance with some earlier findings. For instance, Masson and Pattillo (2001) found large negative movement in the terms of trade for WAMZ nations. However, the result further corroborates the finding of Ogunkola (2005) that real exchange rate variance in ECOWAS particularly the non-CFA countries has considerably narrowed around the range of 0.09 to 0.115 in the post Structural Adjustment Period (SAP). The economic implication is that the extent to which asymmetries could make monetary union costly depends on the nature and degree of the response of exchange rate to the innovations in the terms of trade (Ricci, 2008).

However, the result for the individual countries indicates that the responses of exchange rate to changes in the terms of trade (TOT) vary. The result shows that one cholesky standard deviation shock in the terms of trade exerts about 0.03 percent shocks response or innovation in the exchange rate within two period lag for The Gambia. In the case of Ghana, a cholesky standard deviation shock in the terms of trade induces about 0.09 percent impulse or innovations in exchange rate within two lag periods. The result further reveals that if the shock in the terms of trade changes by one cholesky standard deviations, the innovations or impulse in the exchange rates will respond by 0.01 and 0.09 standard deviations within two period lag in Nigeria and Sierra Leone respectively. The lag period was selected based on the traditional lag selection criteria (Akaike and Schwartz information) technique. The impulse response results of these countries showing the graphical support to these results are presented in the appendix iii for ease of appreciation and large space requirement.

In general, the evidence revealed by this study on cost due to asymmetric shock is at variance with the earlier findings of Masson and Pattillo (2002) but consistent with the study of Ogunkola, (2001 and 2005), Ogunkola and Jerome (2005) WAMI (2005) even though the approaches differ. A meaningful inference to this result suggests that exchange rate may be very critical for countries with small trade interaction and economies that are relatively less developed

and open. Trade openness could induce flexible adjustments in exchange rate but could take more lag for economies that are less open to adjust in times of recession and asymmetric shocks. Thus, it may become critical for such countries to lose exchange rate needed for domestic adjustments.

5.2.2 Loss of Seigniorage

Table 5.3: Result of Loss of Seigniorage for WAMZ

Dependent Variable: D(MRRGDP)

Data Series: 1980-2009

Variable	Coefficient	t-ratio	Standardized Beta	P-value
C	-0.0001	-0.1289		0.8977
D(GRGDP)*	-0.0007	-2.0054	(-0.23)	0.0474
D(OPNES) *	0.0057	36.0448	(0.20)	0.0000
D(GDPPC)	-0.0002	-0.3893	(-0.08)	0.6978
D(PDGDP)	-0.0001	-0.1892	(-0.20)	0.8503
D(EXPGDP)	0.0003	0.9984	(0.04)	0.3203
	R^2 = 0.92		DW = 3.19	

*** Significant at 5%** **Values in parentheses are the standardized beta.**

The results of the loss of seigniorage equation presented in Table 5.3 above are quite revealing. The fixed effect panel regression estimates show a significant relationship between money reserve and its explanatory variables. The coefficients of government revenue as a percentage of GDP, economic development measured by gross domestic product per capita and expenditure to GDP followed their hypothesized signs while openness and public domestic debt to GDP had unexpected signs. The coefficient of the degree of openness of economies in WAMZ is however, statistically significant at 5% level though with a small magnitude.

Government revenue has a negative and statistically significant effect on money creation in WAMZ though with small magnitude. Economic development had a positive effect but not statistically significant. The negative relationship between money reserve and government revenue confirm the hypothesis that the demand for money reserve (siegniorage) is influenced to a some extent, by the weak government revenue base in sub-Saharan Africa (Easterly, 1999). High disposition to money creation has been the bane of monetary policy effectiveness. This is because, seigniorage is extracted to finance fiscal deficit of the polarized governments in the region. This result appears to represent the overall character of the West African economy and corroborate the findings of Neiberding (2004), Masson and Pattilo (2004) and Debrun, Masson and Pattillo (2010).

This result is supported by the high R-square of about 92 percent. However, the Hausmann Test for fixed, common and random effects was not tenable since the data have been differenced. The overall individual impacts of the variables in terms of the relative effects indicate that government revenue, the level of openness and domestic public debt exerts relatively high influence on money reserve/creation in the region.

The Gambia

Table 5.4: Siegniorage Equation

Dependent Variable: D(MRRGDP)				
Data Series: 1980-2009				
Variable	Coefficient	t-ratio	Standardized Beta	P-value
C	-0.005	-0.1087		0.9144
D(GRGDP)	-0.0067	-0.5363	(-0.055)	0.5969
D(GDPPC(-1))*	-0.0342	-2.4961	(-0.254)	0.0202
D(EXPGDP(-1))	0.0082	0.7333	(0.076)	0.4708
ECM(-1)*	-1.4981	-8.3001		0.0000
R^2 = 0.66		DW= 1.99		

*** Significant at 5%** **Values in parentheses are the standardized beta.**

The countries' results are also evident. In particular, the result of the long-run[11] seigniorage equation for The Gambia indicates that the coefficients of all the explanatory variables followed their hypothesized signs except economic development. The result reveals a relatively low but negative relationship between money reserve and government revenue to GDP as well as the degree of openness, but a positive relationship with the level of economic development proxied by GDP per capita and domestic public debt. However, the short-run error correction mechanism result revealed substantial variation from the long-run. The procedure started from the general to specific (parsimonious models for all the equations). Accordingly, the variables whose signs did not conform to economic expectations and those that had low t-statistics were eliminated.

Table 5.4 presents the parsimonious result for The Gambia. The ECM result shows that the coefficient of the error correction term which measures the degree of adjustment for the seigniorage equation is both statistically significant and negative. Thus, it will rightly act to correct any deviations from long-run equilibrium. Specifically, the coefficient of the contemporaneous one period lagged economic development measured by (GDP per capita) is well signed and statistically significant at 5% level. This empirical revelation is intuitive lending critical support to theoretical postulations. Theory posits that country with low level of economic development is likely to counter balance revenue with money creation.

Moreover, the coefficient of government revenue followed its a priori expectation but is statistically insignificant. Natural wisdom agrees that weak revenue base arising from low level of economic development could propagate the reliance of this policy handle (seigniorage). This finding is consistent with the findings of Aisen and Veige (2005) and Neiberding (2004) but at variance with the submission of World Bank (1994) and Masson and Pattillo (2002).

[11] The long-run results for all the models and countries are presented in appendix 11.

Ghana

Table 5.5: Siegniorage Equation

Dependent Variable: D(MRRGDP)

Data Series: 1980-2009

Variable	Coefficient	t-ratio	Standardized Beta	P-value
C	-0.01	-1.703		0.1079
D(GRGDP)*	-0.01	-2.33	(-0.13)	0.0329
D(OPNES)*	0.01	13.638	(0.81)	0.0000
D(GDPPC)	-0.01	-1.0612	(-0.04)	0.3043
D(EXPGDP)*	0.003	2.6414	(0.14)	0.0178
D(MRRGDP(-1))	0.5178	1.8908	(0.52)	0.0769
D(GRGDP(-1))*	0.0104	3.5996	(0.21)	0.0024
D(OPNES(-1))*	-0.0033	-2.0916	(-0.56)	0.0528
D(OPNES(-2))	-0.0005	-1.6682	(-0.08)	0.1147
D(PDGDP(-1))	-0.0003	-1.3108	(-0.05)	0.2084
ECM(-1)*	-1.0140	-4.0602		0.0009

R^2 = 0.98 DW=1.66

*** Significant at 5%** **Values in parentheses are the standardized beta**.

The coefficients of the long-run seigniorage equation result for Ghana is instructive. It is evident that government revenue, domestic public debt and expenditure to GDP had their hypothesized signs while openness is statistically significant. However, the statistical properties of the regression result suggest that the insignificant nature of most of the variables could be influenced by the behaviour of the long-run residuals. Thus, the error correction mechanism was pursued which showed clearer evidence that the variables impacts' largely in the short-run.

The over 100% negative coefficient of the error correction term is significant indicating that the speed of adjustment to long-run equilibrium is appropriate. The short-run high R-square of 98% confirmed that the explanatory variables have significant effects on money creation in Ghana. The coefficients from the parsimonious result further indicate that money creation in Ghana is mainly determined by government revenue, one period lag of openness of the economy, and government expenditure while economic development is statistically insignificant.

The coefficient of government revenue is negative and significant, reflecting the fact that weak government revenue vis-à-vis (tax base) resulting from lack of economic development and low degree of openness influence significantly the reliance on money reserve in Ghana (World Bank, 1994). Similarly, the coefficient of government expenditure is positive and significant while contemporaneous openness is significant at 5%. High government expenditure and low government revenue induce the demand for counter-balancing seigniorage revenue.

The results are not unexpected as established in the literature. Ghanaian economy suffers volatility in its fiscal variables which necessitate the need for money creation. This result corroborates the findings of Nieberding (2004), Aisen and Viega (2005), and Debrun, Masson and Pattillo (2005) that lack of economic development adversely affects revenue generation in sub-Saharan African counties (SSA) which stem their reliance on money creation. The economic intuition is that giving up direct control of monetary policy (financing instrument) by joining a monetary union may be very costly for Ghana. The group result bears similar evidence with result offered for Ghana and Sierra Leone that relies so much on money creation.

Nigeria

Table 5.6: Siegniorage Equation

Dependent Variable: D(MRRGDP)				
Data Series: 1980-2009				
Variable	Coefficient	t-ratio	Standardized Beta	P-value
C	-0.0032	-0.7641		0.4537
D(GDPPC)*	0.0003	2.0426	(0.23)	0.0545
D(PDGDP)*	0.0006	2.1783	(0.30)	0.0415
D(GRGDP(-1))	0.0001	1.3245	(0.12)	0.2002
D(GDPPC(-1))*	-0.0004	-3.1672	(-0.29)	0.0048
D(GDPPC(-2))	0.0002	1.6430	(0.18)	0.1160
ECM(-1)*	-1.2700	-5.9516		0.0000
R^2 = 0.67		DW= 1.88		

*** Significant at 5%** **Values in parentheses are the standardized beta.**

In the case of Nigeria, the estimates of the seigniorage equation are quite revealing. The long-run equation indicates that the explanatory variables do not strongly influence money reserve or seigniorage in Nigeria. Although government revenue, public debt, government expenditure all followed their a priori expectations, openness of the economy and economic development measured by the gross domestic product per capita were statistically insignificant with wrong signs.

However, the result of the short-run seigniorage equation provided counter-intuitive evidence. The coefficient of the error correction term for Nigeria carried the expected sign with a relatively high speed of adjustment to the long-run equilibrium. From Table 5.6 above, demand for seigniorage adjusts partially by about 127 percent in the short-run towards its long-run. The high R-square of 67 % demonstrates that the changes in the explanatory variables sufficiently explain the variations in money reserve.

The result further indicates that domestic public debt and economic development are the main determinants of money creation in Nigeria. The coefficient of domestic public debt is positive and significant. The one period lag of economic development had expected sign and is equally statistically significant indicating that demand for money creation increases with low level of economic development.

Government revenue is statistically insignificant in both the short-run and long-run scenarios. This nuance has great implication given that government revenue in Nigeria is largely generated from the abundant oil resources which substantially influence money supply mechanisms as emphasized in the theoretical framework. The general wisdom is that seigniorage or money creation in Nigeria may not be well influenced by the explanatory variables. This view is consistent with the findings of World Bank (1994) and Masson and Pattillo (2004).

Sierra Leone

Table 5.7: Siegniorage Equation

Dependent Variable: D(MRRGDP)				
Data Series: 1980-2009				
Variable	Coefficient	t-ratio	Standardized Beta	P-value
C	-0.0046	-0.1907		0.8506
D(GRGDP)*	-0.0060	-0.1350	(0.58)	0.0005
D(GRGDP(-1))*	0.0035	3.4539	(0.38)	0.0024
D(GDPPC(-1))*	-0.0018	-2.7156	(0.41)	0.0133
D(EXPGDP(-2))*	0.0001	1.9986	(0.28)	0.0588
ECM(-1)*	-0.8250	0.1560		0.0000
$R^2 = 0.76$		DW=2.11		

*** Significant at 5%** **Values in parentheses are the standardized beta.**

The long-run seigniorage equation result for Sierra Leone, however, shows that only the coefficient of government revenue followed its theoretical expectations among all the explanatory variables. Although most coefficients of the explanatory variables were not statistically significant, the result reveals that government revenue is statistically significant at 5% levels.

However, the short-run dynamic impact of these variables on money creation is evident. The parsimonious result showed that the coefficient of the error correction term which measures the degree of adjustment for the seigniorage equation is both statistically significant and negative. Thus, it will rightly act to correct any deviations from long-run equilibrium. The high R-square of 76% demonstrates that the variables in the model explain sufficiently, variations in money creation. The short-run result suggested that government revenue, economic development and government expenditure are key determinants of money creation in Sierra Leone.

The dynamic parsimonious seigniorage equation results contained in Table 5.7 indicate that in the short-run, government revenue has a negative but significant effect on money creation while economic development and government expenditure have contemporaneous negative and positive impacts respectively, on seigniorage. Though their magnitudes are small but larger than the long-run effects, they are statistically significant at 5% levels. This result confirms the theoretical postulation that low level of economic development adversely affects government revenue that necessitates the need for money creation.

More also, in terms of relative effect, the estimates of the equation indicates that the coefficient of the government revenue exerts the largest effect on the dependent variable (money reserve). Similarly, the level of economic development proxied by gross domestic product per capita induce the second largest effect while public debt has the lowest impact. Poor economic development substantially weakens revenue stream from direct and indirect taxes. Accordingly, poor tax effort results in weak and fluctuating flow of revenue stream that propels reliance on money creation (Hefeker, 2008). This result is consistent with the findings of Ogunloka (2001) and Masson and Pattillo (2005). The economic intuition of this, in principle, implies that the decision to give up monetary autonomy in Sierra Leone may be costly.

5.2.3 Fiscal policy Distortion

Table 5.8: Result of Fiscal Policy Distortion for WAMZ

Dependent Variable: D(CGGDP)

Data Series: 1980-2009

Variable	Coefficient	t-ratio	Standardized Beta	P-value
C	-1.2095	-0.0904		0.9282
D(MRRGDP)*	2131.9	6.8989	(0.20)	0.0000
D(FDGDP)	6.3946	1.5237	(0.02)	0.1315
D(CABGDP)	-2.4618	-1.0951	(0.01)	0.2767
D(PDGDP)	0.0308	0.0106	(0.01)	0.9916

R^2 = 0.55 DW= 3.1

*** Significant at 5%** **Values in parentheses are the standardized beta.**

The result of fiscal policy distortion equation is indicative as shown in Table 5.8. The fixed effect panel regression result shows that the coefficients of all the explanatory variables had their expected theoretical signs. However, the coefficient of money reserve is high and equally statistically significant at 5% level while fiscal deficit and current account balance were statistically insignificant and negligible. Interestingly, the result follows the theoretical postulation that money creation (seigniorage revenue) and adverse current account balance could determine deficit financing by the governments.

Apart from its statistical significance, the relative contribution of money creation is clearly larger than any other variable that influences domestic credit to the government in WAMZ. Thus, the result implies that money reserve has more impact on fiscal policy distortion in WAMZ. This result further re-affirm the views in the literature that high disposition to the use of money creation instruments influence fiscal deficit financing in the sub-Sahara African region (Easterly, 1999 and Hefeker, 2008). This implies that the monetary policy autonomies would be costly to lose in this zone.

The coefficient of determination indicates that about 55% of the variations in the domestic credit to the government are explained by the changes in the explanatory variables in the region.

The Gambia

Table 5.9: Fiscal Policy Distortion Result

Dependent Variable: D(CGGDP)

Data Series: 1980-2009

Variable	Coefficient	t-ratio	Standardized Beta	P-value
C	-0.0429	-0.0398		0.9685
D(MRRGDP)*	57160	2.6250	(0.38)	0.0155
D(FDGDP(-3))*	0.4475	3.3227	(0.48)	0.0031
ECM(-1)*	-0.5003	-3.3380		0.0030

$R^2 = 0.54$ DW=2.13

*** Significant at 5%** **Values in parentheses are the standardized beta.**

The result of the long-run fiscal policy distortion equation of The Gambia reveals that the explanatory variables followed their hypothesized theoretical signs except domestic public debt. Nevertheless, money reserve, fiscal deficit, current account balance and public debt to GDPs were equally not statistically significant at 5 percent levels in the long-run. However, the possibility of dynamic short-run adjustments was revealed by the error correction mechanism result showed in Table 5.9.

The dynamic parsimonious fiscal policy distortion model indicates that money reserve has a positive and statistical significant effect on fiscal deficit financing in The Gambia. Fiscal deficit equally exerts a significant contemporaneous but positive effect on deficit financing in The Gambia. Specifically, a 1% percent change in fiscal deficit induces about 45% impact on deficit financing within three period lag. This result is striking giving its nexus with theoretical considerations. Economic theory posit that fiscal deficit induces policymakers to fashion out measures of either financing or reducing deficit which often takes some policy lag to address this imbalance.

The short-run coefficient of the error correction term is negative and statistically significant. This implies that when domestic credit to the government deviates from its equilibrium level, there will be a feedback mechanism (through changes in the fundamentals) to correct the mis-alignment. The 54% overall goodness of the fit suggests that the variations in the regressors explain significant the changes in the dependent variable.

In terms of relative effects, the beta coefficients suggest that fiscal deficit exerts the highest effect while money reserve (creation) has the lowest impact among the variables with low estimates in the equation. A striking revelation of the result indicates that the explanatory variables do not sufficiently influence the dependent variable (net domestic credit to the government used to capture fiscal policy distortion) in The Gambia. This result further re-establish the fact that The Gambia is one of the countries that has the lowest fiscal policy distortion record in the second West African monetary zone which may be due to sound institutional and better macroeconomic framework (Easterly, 1999; Masson and Pattillo, 2001 and ECOWAS, 2005).

Ghana

Table 5.10: Fiscal Policy Distortion Result

Dependent Variable: D(CGGDP)

Data Series: 1980-2009

Variable	Coefficient	t-ratio	Standardized Beta	P-value
C	0.3003	0.0077		0.9939
D(MRRGDP)*	2356.5	6.0036	(0.66)	0.0000
D(FDGDP)	1.5555	0.1658	(0.02)	0.8697
D(PDGDP)	0.0308	0.0106	(0.001)	0.9916
ECM(-1)*	-1.0808	-5.1164		0.0000

R^2 =0.67 DW=2.33

*** Significant at 5%** **Values in parentheses are the standardized beta.**

In Ghana, the coefficients of the long-run fiscal policy distortion equation reveal robust estimates with appropriate signs for all the explanatory variables except public debt to GDP. The result indicates also that money reserve, fiscal deficit and adverse current account balance all substantially influence domestic credit financing in Ghanaian economy as explained by the relatively high 38% coefficient of determination. Money reserve was found to be high and statistically significant at 5% level.

The result of the short-run fiscal policy distortion equation in Ghana equally demonstrates that money reserve is positive and significant. Moreover, the contemporaneous fiscal deficit and public debt were not statistically significant. The coefficient of the error correction term is both negative and statistically significant at 5% indicating that the short-run speed of adjustment to long-run equilibrium is evident.

More also, in terms of relative effects (standardized beta coefficient) on the dependent variable, it is evident that money reserve exerts the largest influence on fiscal policy distortion in Ghana. The negative coefficient of the domestic public debt seem to provide support to the views that in the long-run public domestic debt financing in Ghana has not only benefit from the Other Development Assistance scheme (ODA) but enjoys the robust Highly Indebted Developing Countries (HIPC) package of the IMF and World Bank initiative.

This result is in consonance with the findings of Debrun, Masson and Pattillo (2005) and Hefeker (2008). General wisdom supports the result that weak and fluctuating revenue stream in Ghana bears a closer nexus with fiscal policy distortion. Weak revenue base influences the demand for money creation which is a veritable source of fiscal policy distortion in the country. The implication is that the decision to abandon independent monetary policy in Ghana may be impliedly costly.

Nigeria

Table 5.11: Fiscal Policy Distortion Result

Dependent Variable: D(CGGDP)				
Data Series: 1980-2009				
Variable	Coefficient	t-ratio	Standardized Beta	P-value
C	-0.1156	-0.1078		0.9151
D(MRRGDP(-1))*	-5.8729	-2.6609	(0.39)	0.0143
D(FDGDP(-3))*	0.2973	2.1766	(0.32)	0.0405
ECM(-1)*	-0.5017	-3.0775		0.0055
R^2 =0.55		DW=1.98		

*** Significant at 5%** **Values in parentheses are the standardized beta.**

The long-run result for Nigeria showed a strong significant relationship between domestic credit to the government used as proxy for fiscal policy distortion in Nigeria and its determinants; money reserve (creation) by the central bank, fiscal deficit, current account balance and domestic public debt. The coefficients of all the explanatory variables followed their hypothesized signs and are all statistically significant at 5%. The relatively high value of the coefficient of determination provides some robust measure of the goodness of the fit. Moreover, in terms of relative contribution, the 74 and 60 percents effect exert by money reserve and current account balance respectively, reveal their huge influence on domestic credit to the government in Nigeria. Arising from the behaviour of time series data, the dynamic short-run characteristics of these variables on the regressand was considered using the residuals of the long-run as the error adjustment factor.

The result of the dynamic short-run fiscal policy distortion equation for Nigeria is presented in Table 5.11. The result revealed that in the short-run, the major determinant of fiscal policy distortion in Nigeria is money reserve and fiscal deficit. The R-square of 0.55% implies that these variables sufficiently explain the variation in the dependent variable.

Money reserve has a high negative statistical significant effect on domestic credit to the government in Nigeria. This is not surprising given that money supply mechanism in Nigeria is largely driven by the changes in the Nigeria's major source of exports (oil). It is equally evident from the result that the coefficient of fiscal deficit has a positive and statistically significant effect on domestic credit in Nigeria. It is found that a 1% percent change in fiscal deficit in Nigeria results in about 30% effect on domestic credit within three period lag. Fiscal dominance has been the bane of monetary policy effectiveness in sub-Saharan Africa over the years. Despite the abundant resource of the country, she has often times ran budget deficit particularly in the 1980s and 1990s. Nigerian government often times make pronouncement for supplementary appropriation bills to carter for unintended expenses which distorts fiscal planning. Such counter-balancing role will be illusive if monetary policy autonomy is abrogated.

Finally, the error correction term of the ECM for Nigeria is statistically significant with expected sign. The over 46% speed of adjustment of the short-run domestic credit to the government towards its long-run equilibrium is statistically sufficient. This result supports the preponderance of evidence in the literature that fiscal dominance is high in Nigeria (Masson and

Pattillo, 2004; IMF, 2005; Oyejide, 2005 and Debrun, Masson and Pattillo, 2005). In particular, Debrun, Masson and Pattillo (2005 & 2010) report that monetary union involving Nigeria in ECOWAS on account of fiscal policy asymmetries may not be beneficial. There are two dimensions to this result for Nigeria. Firstly, Nigeria is a resource-oil rich nation. Secondly, her fiscal stance and operations depend largely on the vagaries of oil price and volume supplied to the international market. An economic implication of this is that to some extent, forming a monetary union with country(s) with high fiscal policy distortion record may be costly except for other considerations.

Sierra Leone

Table 5.12: Fiscal Policy Distortion Result

Dependent Variable: D(CGGDP)				
Data Series: 1980-2009				
Variable	Coefficient	t-ratio	Standardized Beta	P-value
C	-1.9643	-0.6885		0.4980
D(CABGDP(-3))*	1.9574	3.7668	(0.57)	0.0010
ECM(-1)*	-0.3056	-2.1416		0.0430
R^2 = 0.50		DW=2.16		

*** Significant at 5%** **Values in parentheses are the standardized beta.**

The long-run fiscal policy distortion equation result for Sierra Leone indicates that the explanatory variables do not strongly influence domestic credit to the government. Only the coefficient of fiscal deficit had the expected theoretical sign. More also, the variables were not statistically significant with a poor goodness of the fit as shown by a low value of the coefficient of determination. The possibility of long-run variation from the short-run adjustments was however, pursued using the dynamic short-run error correction method.

The parsimonious result is presented in Table 5.12. From the table, current account balance has a positive and significant effect on fiscal policy distortion in Sierra Leone in the short-run. The result shows that the coefficient of the contemporaneous current account balance in Sierra Leone is statistically significant at 5% within three period policy lag. This suggests that financing takes some time in responding to change in the current account balance in Sierra Leone. Both the internal and external balance conditions pose concerns for policymakers given that the degree to which disequilibrium may arise in either case compel policymakers to adjust economic conditions. In less open developing economies like Sierra Leone, adverse current account balance often pose substantial challenge due to the necessity to finance imports with highly volatile external reserve. Thus, deficit financing may become second best option with some policy lag.

Money reserve was highly insignificant in both the long-run and short-run scenarios. This result is not consistent with the submissions of Debrun, Masson and Pattillo (2005) and Hefeker (2008) that Sierra Leone is one of developing countries that rely on money creation for fiscal deficit financing. However, it is evident in the background literature that fluctuating external donor grants plays critical role in the fiscal operation of the Sierra Leone economy which could influence greatly fiscal policy distortion.

The speed of adjustment captured by the error correction term is statistically significant. This suggests that deviations from equilibrium are corrected at about 30% percent per period. The intuition is that when fiscal policy distortion deviates from its equilibrium level, there will be a feedback mechanism (through changes in the fundamentals) to correct the mis-alignment. About 50% variation in the dependent variable is explained by the change in the explanatory variable. Natural wisdom, however, conjures that fiscal policy distortion in any form could be

costly to the West African monetary union (De Grauwe and Mongelli, 2008 and Debrun, Masson and Pattillo 2005).

5.3 Estimates of Benefits of Monetary Union

5.3.1 Trade Creation Model

Table 5.13: Result of the Panel Gravity (trade creation) model for WAMZ

Dependent Variable: D(TFLO)				
Data Series: 1980-2009				
Variable	Coefficient	t-ratio	Standardized Beta	P-value
C	0.0008	0.6220		0.8797
D(GDP)	-0.0035	-0.1517	(0.02)	0.8797
D(POP)	-05051.8	-0.1695	(-0.01)	0.8657
D(OPNES)*	6364.2	3.1418	(0.09)	0.0022
D(TFLO(-1))*	0.9514	30.5075	(0.95)	0.0000
R^2 = 0.90	DW= 2.22			

*** Significant at 5%** **Values in parentheses are the standardized beta.**

The result of the gravity model of the trade creation benefit is also evident. With regard to the group, the panel regression analysis result reveals that all the explanatory variables except market size measured by the gross domestic product (GDP) and population had their hypothesized signs. The result shows a significant relationship between trade flow in WAMZ and openness of the economy as well as the lag of trade flow at 5% levels. The magnitude of the openness and lag of trade flow are equally very high.

Market sizes measured by output (GDP) and population have negative and statistically insignificant effects on trade flow in the region. This theoretical relationship is unexpected given that both variables are expected as the key determinants of trade flow. The result corroborates the views of Debrun, Masson and Pattillo (2010) that the trade creation gains of monetary unification in the second West African monetary zone is likely to be less beneficial. The thrust of this prediction is anchored on the nature of trade interaction among members of the zone. It is however, expected that the more open the economies in the zone, the higher the potential gain associated with trade creation as portrayed in Table 5.13.

In terms of relative contribution, it is evident that the lag of trade flow and openness account for the greater impact on trade creation resulting from economic and monetary integration. The traditional wisdom is that openness of the economy influences the market sizes of the economies which further stimulate trade creation in the zone. Moreover, it is indicative that monetary union may take some period lag to insulate in the integrating economies as evident in the result.

Cumulatively, the overall impact of monetary union on trade creation arising from market size is 1.06 percent compared with the 13.3 percent found by Nnanna *et al.* (2007) and 3 percent for the EMU (Rose, 2000). The economic intuition is that though the overall effect is not yet high, monetary integration has the capacity to enhance trade flows in WAMZ due to the increasing openness of the economies. The 90 percent goodness of the fit provides some measure of confidence to this result.

The Gambia

Table 5.14: Trade Creation Result

Dependent Variable: D(TFLO)

Data Series: 1980-2009

Variable	Coefficient	t-ratio	Standardized Beta	P-value
C	-6949.0	-0.4872		0.6314
D(GDP)*	0.005	2.3196	(0.47)	0.0311
D(TFLO(-1))*	0.9128	2.8930	(0.91)	0.0090
D(TFLO(-2))*	0.5176	2.7212	(0.51)	0.0132
D(GDP(-2))	-0.0005	-2.2152	(-0.53)	0.3850
D(OPNES(-2))*	9029.1	2.3556	(0.33)	0.0288
ECM(-1)*	-1.2296	-3.3350		0.0033

R^2 =0.61 DW=2.33

*** Significant at 5%** **Values in parentheses are the standardized beta.**

In The Gambia, the long-run trade creation equation result confirm the positive relationship between trade flow and gross domestic product GDP as well as that of the lag of trade flow. This association is equally statistically significant while the coefficients of openness and market size measured by population were not statistically significant. Furthermore, the magnitude of the impact of GDP on trade flow is very small indicating that the market size of output is not a strong determinant of trade flow in Gambia. The result of the dynamic short-run error correction model provides robust support to the long-run estimates.

From Table 5.14, the positive but relatively small magnitude of output size proxied by the gross domestic product on trade creation in the short-run is confirmed as amplified by the estimates of the long-run regression result. The result further revealed that the contemporaneous variables GDP, openness and the lag of trade flow used as control variables for the impact of economic integration exert statistical influence on the dependent variable. The contemporaneous variables are statistically significant at 5% levels.

The error correction term had the expected sign and is equally statistically significant. The result implies that deviations from the long-run equilibrium would take about 122% to correct the short-run dynamics. The R-squared of 61% shows that the variations in the dependent variable are substantially explained by the changes in the explanatory variables.

However, it is also revealed by the standardized beta coefficient that the relative contribution of gross domestic product in The Gambia could stimulate trade creation. The standardized beta result shows that the relative contribution of openness of the economy due to monetary integration had the smallest magnitude in terms of weight. The Gambia is a small less open economy with weak export base which implies that her trade interaction may be considerably small. This finding is in line with the submission of Debrun, Masson and Pattillo (2010) that monetary unification may have relatively small trade creation effect in WAMZ/ECOWAS economies.

Ghana

Table 5.15: Trade Creation Model Result

Dependent Variable: D(GDPGR)				
Data Series: 1980-2009				
Variable	Coefficient	t-ratio	Standardized Beta	P-value
C	0.0003	3.2516		0.0038
D(OPNES)	16249	1.5194	(0.10)	0.1436
D(TFLO(-1))**	-0.1138	-1.7006	(0.11)	0.1038
D(GDP(-1))**	-0.4580	-1.9601	(-0.14)	0.0634
D(POP(-2)*	-0.0005	-2.3913	(-0.17)	0.0262
ECM(-1)*	1.0427	14.4058		0.0000
R^2 =0.91	DW=2.21			

*** Significant at 5%** **Values in parentheses are the standardized beta.**

In addition, the long-run trade creation model result for Ghana shows a weak relationship between trade flow and its determinants. In particular, the coefficients of output size measured by GDP had wrong sign with a statistically insignificant effect on trade flow in Ghana. The lag of trade flow is positive and significant. The dynamic short-run error correction mechanism result provides a balance support to this finding.

The parsimonious short-run trade creation model for Ghana indicates that the explanatory variables have negligible impact on trade creation. Openness of the economy had statistically insignificant relationship with trade creation. The coefficients of the contemporaneous output (GDP) and market size (population) have wrong signs albeit statistically significant at 10% levels. The economic intuition of this result is that Ghanaian economy has not responded to the trade gains associated with economic and monetary integration in the zone.

This finding is supported by the high R-square of 91% indicating that the variations in the dependent variable are accounted for by the contemporaneous explanatory variables. The coefficient of the error correction terms is statistically significant at 5%.

Moreover, in terms of relative contribution, population and the lag of trade flow constitute the largest individual effects on trade flow respectively, in Ghana even though they do not satisfy the a priori criteria. A counter-intuitive argument in support of this result is that trade flow in Ghana is relative small as indicated by the output measured by the gross domestic product. However, the institution of a monetary integration framework has the potential mechanism of institutionalizing trade flow in the Ghanaian economy. This is likely to be induced substantially by the market size effect of population Vina (1950) and O'Connell (1998).

Nigeria

Table 5.16: Trade Creation Model Result

Dependent Variable: D(TFLO)				
Data Series: 1980-2009				
Variable	Coefficient	t-ratio	Standardized Beta	P-value
C	6901.3	2.5450		0.0185
D(GDP)*	0.0004	5.1315	(0.41)	0.0000
D(OPNES)*	5962.4	2.8114	(0.21)	0.0102
D(TFLO(-1))*	-0.2832	-3.4874	(-0.28)	0.0021
D(POP(-1))*	-17073	-2.3303	(-0.18)	0.0294
ECM(-1)	1.0271	11.1274		0.0000
R^2 = 0.88	DW= 1.96			

*** Significant at 5%** **Values in parentheses are the standardized beta.**

The gravity model result with regard to Nigeria is quite indicative and instructive. The result of the long-run trade creation equation shows a strong statistical relationship between trade flow and the determinants. In particular, the coefficients of the variables followed their hypothesized signs except market size measured by the gross domestic product which is equally insignificant. Market sizes proxy by population, openness and the lag of trade flow were all statistically significant. It is evident that the market effect of population accounts for about 21.6 percent in the trade flow. This result is consistent with the finding of Anyanwu (2003) and Balogun (2008) that population is a key element that drives external trade.

However, the dynamic short-run error correction model result contained in Table 5.16 is counterintuitive. The contemporaneous variables do not have significant effects on trade flow. The coefficient of output (GDP) is positive and statistically significant at 5%. However, the magnitude of the impact of GDP on trade creation is very small. This is not surprising because as espoused by theory, the marginal benefits will be lower for countries with high degree of market size (output). Thus, economic and monetary integration will lead to trade diversion because economic agents will direct trade to the region where the marginal benefits may be higher.

The positive effect of openness on trade creation in Nigeria is confirmed by the short-run parsimonious result of the study as amplified in the trade development literature. Market size measured by population had a wrong sign even though it is significant in the short-run. The coefficient of the error correction term is significant with unexpected sign. However, the high R-squared of 88% indicates that the variations in the dependent variable are well explained by the changes in the explanatory variables.

Furthermore, in terms of relative contribution, market size measured by GDP has the largest impact followed by the openness of the economy. Intuitively, it is expected that Nigeria large population could stimulate trade flow relative to other members in the region. The result however, provided counterintuitive evidence to this assumption. The general wisdom is that trade creation gains may be compensatory. The intuition is that trade flow move to the places where their marginal benefits could become larger due to economic and monetary unification.

Sierra Leone

Table 5.17: Trade Creation Model Result

Dependent Variable: D(TFLO)				
Data Series: 1980-2009				
Variable	Coefficient	t-ratio	Standardized Beta	P-value
C	-2261	-13654		0.1910
D(GDP)*	0.3638	3.6469	(0.77)	0.0022
D(OPNES)*	0.0005	7.8677	(0.46)	0.0000
D(TFLO(-1))**	-0.2439	-1.8452	(-0.24)	0.0836
D(GDP(-1))*	0.2481	3.6789	(0.51)	0.0020
D(POP(-3))**	0.0001	2.0007	(0.15)	0.0627
D(OPNES(-1)) **	0.0001	3.4259	(0.29)	0.0635
D(OPNES(-2))*	0.0001	3.7539	(0.28)	0.0017
ECM(-1)*	1.02589	8.1719		0.0000
$R^2 = 0.66$	DW=2.34			

*** Significant at 5%** **Values in parentheses are the standardized beta.**

Furthermore, the long-run gravity model result for Sierra Leone reveals a strong positive statistical relationship between trade flow and market sizes measured by output, population and openness of the economy. However, the coefficient of market size of population is statistically insignificant. The result indicates that a one percent increase in output could stimulate trade by about 16%. The 98 percent overall goodness of the fit indicates that changes in the explanatory variables strongly influence the dependent variable.

The short-run trade creation result for Sierra Leone is presented in Table 5.17. It is obvious from the parsimonious result that the key determinants of trade flow in Sierra Leone are the contemporaneous GDP and openness. From the analysis, the coefficient of output (GDP) is positive and statistically significant at 5%. This suggests that a 1% increase in market size measured by output could stimulate potential trade by over 36% in Sierra Leone. Openness has a positive significant relationship with trade flow. However, the magnitude of the impact is relatively small. The lags of these variables were though statistically significant but with very weak impacts on trade flow.

The error correction term is statistically significant but have unexpected sign like Nigeria. The result indicates that deviation in the short-run equilibrium adjust towards the long-run by over 102%. The relatively high coefficient of determination indicates that the variations in the regressand are well explained by the changes in the regressors.

Moreover, in terms of relative contribution, market size measured by output constitutes the largest impact followed closely by openness of the economy. Similarly, the relative contribution of population is extremely marginal. Arguably, the trade creation benefits due to monetary integration may stem from output effect through the openness of the economy of Sierra Leone.

5.3.2 Financial and Capital Market Effects

Table 5.18: Capital Efficiency Model Result for WAMZ

Dependent Variable: D(GDPGR)

Data Series: 1980-2009

Variable	Coefficient	t-ratio	Standardized Beta	P-value
C	-0.0644	-0.0960		0.9236
D(GCPS)	0.0087	0.9544	(0.13)	0.3420
D(ITS)*	0.6205	1.9796	(0.11)	0.0503
D(EXCHRT)	0.0003	0.1283	(0.06)	0.8981
D(INFL)	0.0073	0.3018	(0.01)	0.7633

R^2 =0.25 DW = 2.9

*** Significant at 5%** **Values in parentheses are the standardized beta**

Evidence from the capital efficiency-growth model for the West African Monetary Zone (WAMZ) in Table 5.18 is quite revealing. The fixed effect panel result indicates that the explanatory variables (financial development indicators) do not strongly influence economic growth. Although the coefficients of the variables followed their hypothesized theoretical signs, only the coefficient of interest rate spread is statistically significant at 5% levels. The coefficient of interest rate spread is equally high while the coefficient of the growth rate of credit to the private sector (core index) of financial development is statistically insignificant.

Exchange rate and inflation rate variables used as control variables are statistically insignificant and have negligible impacts on economic growth. Capital efficiency is expected to be contingent upon financial development through efficient utilization of financial instruments propelled by monetary integration and financial globalization. This result is in consonance with the findings of Ogunleye (2008) that financial globalization has not deeply influence major macroeconomic indicators that affect growth but when these factors are fully integrated, they could propel the growth of the financial system in sub-Saharan Africa. Interestingly, the relative contribution of the growth rate of the credit to private sector is higher and followed closely by the spread in interest rate in WAMZ.

The Gambia

Table 5.19: Capital Efficiency Model Result

Dependent Variable: D(GDPGR)				
Data Series: 1980-2009				
Variable	Coefficient	t-ratio	Standardized Beta	P-value
C	-0.6117	-1.5550		0.1356
D(GCPS)	0.0068	0.5350	(0.06)	0.5985
D(ITS)**	0.3506	1.7132	(0.20)	0.1021
D(ITS(-3))*	1.1659	3.3555	(0.63)	0.0031
D(INFL(-2))*	0.1728	2.7769	(0.33)	0.0000
ECM(-1)*	0.9212	0.1476		0.0000
R^2 =0.77 DW= 1.98				

*** Significant at 5%** **Values in parentheses are the standardized beta.**

In The Gambia, the result of the long run capital efficiency model indicates a weak statistical relationship between financial development indicators and economic growth. The coefficients of the explanatory variables had their expected signs but were all statistically insignificant at 5% levels. The growth rate of credit to the private sector (a core financial development indicator) is not only insignificant but had a negligible effect. The low value of the coefficient of determination provides support that the explanatory variables do not strongly influence economic growth.

However, the dynamic parsimonious model result contained in Table 5.19 indicates that in the short-run, interest rate spread and inflation are key variables that influence economic growth in The Gambia. While interest rate spread is significant at 10%, the contemporaneous interest rate spread also has a higher positive effect on growth and is statistically significant at 5%. Inflation has a positive impact on economic growth in the short-run. The coefficient of the growth rate of credit to the private sector, a core index of financial development is statistically insignificant. Clearer pictures of this result re-affirm the fact that the financial system in The Gambia is relatively not well developed to consolidate on the factors (core) financial development that impinge or propel growth.

The result for The Gambia further indicates that the error correction term which measures the speed of adjustment is statistically significant with expected sign. The speed of adjustment to long-run equilibrium is about 92%. Similarly, the R-squared of about 77% suggests that the variations in the dependent variable are well explained by the changes in the explanatory variables.

In terms of relative effects, the convergence of interest rate (interest rate spread) at the third lag period exerts larger impact followed by the growth of credit to the private sector. Intuitively, the macroeconomic stability prevailing in The Gambia economy could be more responsive to this effect with little or no link with financial globalization.

Ghana

Table 5.20 Capital Efficiency Model Result

Dependent Variable: D(GDPGR)				
Data Series: 1980-2009				
Variable	Coefficient	t-ratio	Standardized Beta	P-value
C	0.3258	0.8673		0.3947
D(GCPS)*	0.0207	2.4408	(0.33)	0.0228.
D(GDPGR(-1))*	0.4144	2.5393	(0.42)	0.0183
D(INFL(-1))*	0.0554	4.7370	(0.70)	0.0001
ECM (-1)*	-0.8150	-4. 2645		0.0003
	R^2 =59	DW= 2.51		

*** Significant at 5%** **Values in parentheses are the standardized beta.**

Similarly, with regard to Ghana, the long-run result of the capital efficiency model in the appendix11 is striking. The result shows that the coefficients of the explanatory variables had their theoretically hypothesized signs except inflation. There is also a weak statistical significant relationship between financial development indicators and economic growth, however, growth rate of credit to the private sector (core) index of financial development is statistically significant at 10% level in the long-run.

On the other hand, the dynamic short-run regression result above reveals that growth rate of credit to the private sector and inflation are the key determinants of economic growth used to endogenize the impact of financial globalization on economic growth. Credit to the private sector is significant while the contemporaneous inflation had expected sign and is statistically significant in the parsimonious equation result. The result suggests that financial globalization has induced the growth rate of credit to the private sector which generates positive spillover effects on growth as postulated by the supply-leading hypothesis. However, financial globalization has no significant impact on interest rate spread and exchange rate in Ghana. It is instructive to state that the financial sector or system in Ghana is relatively less develop given the large divergence in the interest rate spread and the highly volatile exchange rate. This result has been reached by some similar studies (see, Obadan, 2006; Obiora, 2007 and Ogunleye, 2008) on the selected sub-Saharan African countries (SSA). Evidently, the relative contribution of inflation rate on growth is equally higher than the contribution of other indicators.

The dynamic error correction term had expected sign and is equally statistically significant. The result further indicates that deviations in the long-run equilibrium have a feedback effect or mechanism with the fundamental changes in the variables from their mis-alignment. The R-squared result indicates that the explanatory variables explain about 59% of the changes in the dependent variable.

Nigeria

Table 5.21: Capital Efficiency Model Result

Dependent Variable: D(GDPGR)				
Data Series: 1980-2009				
Variable	Coefficient	t-ratio	Standardized Beta	P-value
C	-0.6131	-1.5908		0.1273
D(ITS)	0.3313	1.6530	(0.19)	0.1139
D(GCPS(-1))	-0.0127	-1.0408	(-0.11)	0.3104
D(ITS(-3))*	1.1912	3.5145	(0.64)	0.0022
D(INFL(-2)) *	0.1771	2.9032	(0.55)	0.0088
ECM(-1)*	-0.9127	-6.3191		0.0000
R^2 =0.77 DW= 1.98				

*** Significant at 5%** **Values in parentheses are the standardized beta.**

In terms of the benefits associated with financial and capital market effects of financial globalization, the result for Nigeria indicates that the explanatory variables except exchange rate did not followed their expected signs in the long-run. Exchange rate, however, is used as a control instrument such that financial globalization could induce a pass-through effect. It is equally statistically significant and exerts substantial influence on financial sector development in Nigeria. The long-run result further reveals that other (core) financial indicators that propel growth seem to be at variant with economic growth.

On the other hand, Table 5.21 above shows the dynamic error correction model result for Nigeria. The result indicates that the contemporaneous interest rate spread and inflation are statistically significant with expected hypothesized signs. Interest rate spread has positive relationship with the growth variable used to proxy the financial integration effects of monetary integration in the third period lag. This indicates that the dependent variable take some policy lag to respond to the changes in the interest rate differential. Similarly a 1% change in inflation rate due to financial liberalization is accompanied by about 18% effect on economic growth in Nigeria. The theoretical implication of this is that inflation is an important determinant of economic growth (see, Taylor's rule and the augmented Phillip's curve hypothesis).

The coefficient of the error correction term is statistically significant with appropriate sign indicating that the deviations in the long-run equilibrium can be corrected by the fundamental changes in the long-run. The high 77% goodness of the fit suggests that the variations in the regressand are well explained by the contemporaneous regressors.

Overall, the relative contribution of interest rate spread is equally higher than any other indicator followed by inflation. This finding corroborates the finding of Ogunleye (2008) that financial globalization has a great influence on macroeconomic aggregates that affect economic growth in Nigeria.

Sierra Leone

Table 5.22: Capital Efficiency Model Result

Dependent Variable: D(GDPGR)

Data Series: 1980-2009

Variable	Coefficient	t-ratio	Standardized Beta	P-value
C	1.8549	0.7569		0.4579
D(EXCHRT)*	-0.0277	-2.0665	(-0.35)	0.0520
D(INFL)*	0.0949	2.2276	(0.34)	0.0375
D(GDPGR(-2))**	0.3380	1.9997	(0.34)	0.0593
D(ITS(-2))**	-0.9823	-1.9274	(-0.31)	0.0682
D(EXCHRT(-2))	0.0157	1.3845	(0.20)	0.1814
ECM(-1)*	-0.9702	-4.9338		0.0001

R^2 =0.61 DW=2.61

*** Significant at 5%** **Values in parentheses are the standardized beta.**

In the case of Sierra Leone, the coefficients of all the explanatory variables used to control for financial development followed their a priori expectations except interest rate differential in the long-run. Although the result suggest a positive relationship between economic growth and the financial development indicators, the coefficients of the growth rate of credit to private sector and interest rate spread were found to be statistically insignificant.

The parsimonious regression result reveals that the contemporaneous variables had unexpected signs except inflation rate. Exchange rate and interest rate spread had negative relationship with growth though statistically significant at 5%. As in the case of Nigeria, the contemporaneous inflation rate has a positive statistically significant effect on the economic growth in Sierra Leone. Thus, a 1% percent change in inflation relative to financial globalization induces about 10% effect on economic growth in Sierra Leone. The revelation of this result is striking given that Sierra Leone is one of the countries with the highest record of inflation yet, she has the most impressive growth performance since 2000 she recovered from her political crises.

Furthermore, the error correction term is statistically significant with expected negative sign. The coefficient of -0.9702 indicates that 97% of the past deviation will be corrected in the current period. The 61% measure of the goodness of fit provides robust support that the variations in the dependent variable are accounted for by the changes in the independent variables.

However, in terms of relative effects, inflation rate equally induce more influence on the economic growth than any other variable as evident in the standardized beta coefficient.

5.3.3 Policy Coordination Gains

Table 5.23: Policy Coordination Model Result for WAMZ

Dependent Variable: D(INFL)

Data Series: 1980-2009

Variable	Coefficient	t-ratio	Standardized Beta	P-value
C*	52.5800	6.8570		0.0000
D(EXPGDP)*	-1.1433	-3.7031	(-0.03)	0.0003
D(OPNES)	-0.0325	-0.0811	(-0.04)	0.9355

R^2 = 0.23 DW= 1.34

*** Significant at 5%** **Values in parentheses are the standardized beta.**

The result of the policy coordination gain from the fixed effect panel regression shows a significant relationship between inflation rate and government expenditure to GDP. The sign of openness was unexpected as it did not follow its hypothesized theoretical sign. Similarly, the coefficient of openness is statistically insignificant and negligible. Government expenditure is statistically significant. The result suggests that monetary union has influence on government spending given the statistical relationship between policy control variable (inflation) and government expenditure. The intuition is that monetary union helps in strengthening governments' fiscal expenditures.

It is, however, instructive to note that the relative individual contributions of the explanatory variables are small in magnitude in terms of the effect of these variables on the control variable. Theoretically, it is expected that economic and monetary integration would improve the openness of the economies and openness could help to increase trade taxes and strengthen inflationary trends. This result seems to reject this hypothesis and further validates the prediction of Debrun, Masson and Pattillo (2010) that the expected gains from trade creation may be inconsequential in the African regional integration schemes.

The Gambia

Table 5.24: Policy Coordination Model Result

Dependent Variable: D(INFL) Data Series: 1980-2009				
Variable	Coefficient	t-ratio	Standardized Beta	P-value
C	-0.0328	-0.0210		0.9834
D(OPNES)	12.9160	1.5782	(0.30)	0.1282
D(EXPGDP(-1))*	-0.8517	-2.2212	(-0.36)	0.0365
D(OPNES(-1))	7.5276	8.5031	(0.17)	0.3852
ECM(-1)*	-0.6539	-3.4874		0.0020
R^2 =0.52 DW= 2.13				

*** Significant at 5%** **Values in parentheses are the standardized beta.**

However, the result of the policy coordination equation in The Gambia is indicative. All the explanatory variables followed their hypothesized theoretical expectations and were equally statistically significant at 5 percent in The Gambia. The measure of the goodness of the fit indicates that the explanatory variables account for over 32 percent of the variation in the dependent variable. Having established the long-run result, the short-run error correction mechanism was carried out to determine the dynamics of adjustment as contained in Table 5.24.

The coefficients of the parsimonious policy coordination equation result revealed that the contemporaneous variables influence the dependent variable. The coefficient of contemporaneous government expenditure has a negative and significant impact on the policy variable (inflation). Specifically a 1% reduction on government expenditure due to policy coordination exerts about 85% change in inflation as evident in the regression result. From the analysis, openness has a positive but negligible and insignificant effect on inflation in The Gambia. The possibility of this result is unambiguous given that the economy of Gambia is relatively not open and may not exert strong influence on inflation.

The error correction term which measures the speed of adjustment of the equilibrium error is statistically significant with appropriate sign. It is evident from the table that deviations from the long-run equilibrium can be corrected by 65%. More also, the 52% robust coefficient of determination suggests that the changes in the explanatory variables well explain the variations in the dependent variable.

Moreover, in terms of relative contribution, government expenditure equally exerts more influence than openness of the economy. It is believe that monetary union inculcates guided spending through policy based-rules and contracts (Walsh, 1995). This result confirms the prediction of Barro and Gordon (1983) and Hefeker (2008) and lends support to the earlier findings of Debrun, Masson and Pattillo (2010).

Ghana

Table 5. 25: Policy Coordination Gain Model Result

Dependent Variable: D(INFL)				
Data Series: 1980-2009				
Variable	Coefficient	t-ratio	Standardized Beta	P-value
C*	-8.9350	-2.9077		0.0084
D(OPNES)**	-0.2711	-1.7405	(-0.22)	0.0964
D(EXPGDP(-2))*	2.4840	2.6123	(0.33)	0.0163
D(EXPGDP(-3))	1.1421	1.1559	(0.15)	0.2607
ECM(-1)	-0.7705	-5.7813		0.0000
R^2 =0.67 DW=2.39				

*** Significant at 5%** **Values in parentheses are the standardized beta.**

In the case of Ghana, the long-un policy coordination model result suggests a statistical relationship between the policy variable and the explanatory variables. Moreover, while the sign of the openness of the economy did not follow its expected sign, expenditure to government as percentage of the GDP had expected sign and is statistically significant at 5%. It is equally evident that government expenditure exerts more influence than the openness in the long-run. This result reaffirms the view that a fiscally volatile economy like Ghana may enjoy the benefit of reduced unguided spending propelled by policy coordination through the instrumentality of monetary union. Similar predictions have been established in the literature by Masson and Pattillo (2004) and Debrun, Masson and Pattillo (2005).

However, the long-run result is not supported by the dynamic parsimonious equation result. It is evident from the short-run result that the contemporaneous variables do not have strong statistical relationship with the dependent variable. Both government expenditure and openness of the economy had unexpected signs indicating that both variables are not responsive or sensitive to economic integration during the period.

The dynamic error correction term is negative and statistically significant. The economic intuition is that when the dependent variable deviates from its equilibrium level, there will be a feedback mechanism through the changes in the fundamentals to correct the misalignment. The 67% R-square coefficient indicates that the variations in the dependent variables are systematically explained by the changes in the explanatory variables.

Nigeria

Table 5.26: **Policy Coordination Gain Result Nigeria**

Dependent Variable: D(INFL)				
Data Series: 1980-2009				
Variable	Coefficient	t-ratio	Standardized Beta	P-value
C	-0.1452	-0.0939		0.9259
D(OPNES)	8.5981	1.3143	(0.20)	0.2011
D(EXPGDP(-1))*	-0.7412	-2.0537	(-0.31)	0.0511
ECM(-1)*	-0.6723	-3.6248		0.0014
R^2 =0.67 DW=2.13				

*** Significant at 5%** **Values in parentheses are the standardized beta.**

The policy coordination equation result for Nigeria shows that the coefficients of the explanatory variables had their expected hypothesized signs and are equally statistically insignificant.

The dynamic short-run policy coordination result is contained in Table 5.26. The parsimonious result indicates that the policy variable has a negative statistical relationship with contemporaneous government expenditure. The result suggests that a one percent decrease in government expenditure propelled by economic and monetary integration through policy coordination could induce about 74% reduction in inflation in Nigeria. The coefficient of openness of the economy has no significant effect on the policy variable.

The dynamic error correction term which measures the speed of adjustment of the error from the long-run equilibrium is statistically significant. However, the speed of adjustment is relatively slower than other members of the zone. The statistical significant of the result is supported by the high 67% coefficient of determination.

Sierra Leone

Table 5.27: Policy Coordination Gain Model Result

Dependent Variable: D(INFL)				
Data Series: 1980-2009				
Variable	Coefficient	t-ratio	Standardized Beta	P-value
C	-0.9912	-0.1876		0.8527
D(INFL(-1))	0.0693	0.4153	(0.07)	0.6816
D(EXPGDP(-1))*	-3.7870	-3.0908	(0.53)	0.0050
ECM(-1)*	-0.3447	-1.9515		0.0628
	R^2 =0.54 DW=2.27			

*** Significant at 5%** **Values in parentheses are the standardized beta.**

Moreover, the long-run result for Sierra Leone shows that the coefficients of the explanatory variables had their expected signs. The result shows a negative statistical relationship between inflation and government expenditure and a positive relationship between inflation and openness in Sierra Leone. Similarly, the relative effect of government expenditure on inflation is higher than openness of the economy

The dynamic short-run policy coordination result is contained in Table 5.27. The parsimonious result indicates that the contemporaneous government expenditure has a negative statistical relationship with policy variable. The result suggests that a one percent decrease in government expenditure propelled by economic and monetary integration through policy coordination could induce about 38% reduction in inflation in Sierra Leone. The coefficient of the contemporaneous openness of the economy has no significant impact on the policy variable.

The dynamic error correction term which measures the speed of adjustment of the error from the long-run equilibrium is statistically significant. However, the speed of adjustment is relatively slower than other members of the zone. The statistical significant of the result is supported by the high 54% coefficient of determination.

5.4 Estimates of Net-Benefits

To determine the net-benefit of monetary union in WAMZ, we developed indices for comparison. The parameter estimates of the cost and benefit models were used to develop the composite indexes (CI) for the cost-benefit analysis. The procedure started with the estimation of the behavioural models data to obtain parameters estimates. Furthermore, the standardized beta coefficients of the estimates were then used to obtain relative weights for the variables. The relative weights were then normalized by multiplying the significant variables with the data and summed up across time series to obtain the indices of the elements for each of the categories. The parameter estimates (standardized beta) of the composite indices were then obtained as the indicators of the cost and benefit elements. The result is presented in Table 5.28 below:

Table 5.28: Composite Index Result for the Cost-Benefit Analysis

Country	Benefit of MU				Cost of MU				
	Trade creation	Financial and capital market effect	Policy coordination gain	**Total Benefit**	Asymmetric shock	Loss of Siegniorage	Fiscal policy distortion	**Total Cost**	NB
THE GAMBIA	0.96(39)	0.01(1)	0.34(25)	**1.31**	0.03(14)	0.11(8)	0.15(22)	**0.29**	**1.02**
GHANA	0.48(19.6)	0.47(52.2)	0.41(31)	**1.36**	0.09(41)	0.91(65)	0.24(36)	**1.24**	**0.12**
NIGERIA	0.01(0.4)	0.03(3.3)	0.29(21.6)	**0.33**	0.01(4)	0.21(15)	0.08(12)	**0.30**	**0.03**
SIERRA LEONE	0.99(41)	0.39(43.3)	0.30(22.4)	**1.68**	0.09(41)	0.16(12)	0.20(30)	**0.45**	**1.23**
WAMZ	2.26(89)	0.23(9)	0.04(2)	**2.53**	0.08(9.2)	0.16(18.4)	0.63(72.4)	**0.87**	**1.76**

***Values in parentheses are the percentages of the total index for WAMZ and the country's share of each element.**

The costs-benefits results as evident in Table 5.28 is quite revealing. The composite index result indicates that Sierra Leone and Ghana bear more cost due to asymmetric shocks. Nigeria and Gambia have relatively smaller cost due to asymmetric response of exchange rate to changes in the terms of trade. Ghana and Sierra Leone share about 41% each of the total costs due to asymmetric response of exchange rate to terms of trade shock in the zone. While cost due to asymmetric shocks account for over 14 percent in The Gambia, it accounts for about 4 percent of the total cost of joining monetary union for Nigeria. Intuitively, the result confirms the evidence of asymmetric shocks in the zone but differ considerably in magnitude as revealed by earlier studies particularly with respect to Nigeria. Masson and Pattillo (2002) noted that given the divergence of trade relation between Nigeria and the rest of ECOWAS countries, asymmetric shock may be large for Nigeria.

In terms of the cost due to the loss of seigniorage, the composite index result suggests that Ghana recorded the highest cost and relatively followed by Nigeria and Sierra Leone. The composite index indicates that Ghana would account for about 65 percentage of the total expected cost of losing monetary policy autonomy in the zone while Nigeria accounts for about 15 percent. Moreover, the result shows that seigniorage loss account for about 12 percent in Sierra Leone. The Gambia has lowest cost of losing monetary policy autonomy in the second West African monetary zone. This element constitutes only 8 percent of the total cost of losing independent monetary policy sovereignty. Naturally, the evidence provided by this result provide further support to the earlier findings of Masson and Pattillo (2005), Easterly (1999) and Ogunkola (2005). World Bank (1994) point that Nigeria and The Gambia belong to the group of countries that rely less on money creation in the post SAP period while Ghana loosely relies so much on monetary liability for financing fiscal deficits. More also, the individual country evidences provide further support for the group country analysis that loss of monetary policy autonomy is likely to be costly. This finding is in consonance with that of Debrun, Masson and Pattillo (2005 and 2010) and DeGrauwe and Mongelli (2005) and contrary to the shocks based studies of Ogunkola and Jerome, (2005) and Ogunkola (2005).

Similarly, the composite index result indicates that the cost due to fiscal policy distortion is higher for Ghana and Sierra Leone. The result indicates that Ghana shares over 36 percent of the total costs due to fiscal policy distortion in the zone. Comparatively, Sierra Leone accounts

for 30 percent while Gambia and Nigeria share about 22 and 12 percentages respectively. The revelation of this result is instructive. Ghana is one of the countries in the sub-Saharan African countries (SSA) known with high fiscal deficit financing record. This is reflected in the high current account to GDP ratio particularly due to high cost of financing current account deficits. There are preponderance of studies in the literature with evidence that fiscal policy stance of Ghana is highly volatile due to weak and fluctuating revenue profile (Easterly, 1994 & 1999; Debrun, Masson and Pattillo, 2005 and Hefeker, 2008). More also, The Gambia and Nigeria have performed relatively better than other members in terms of macroeconomic performance. Both countries have consistently attained some good measure of the convergence criteria. The Gambia has fairly good fiscal-monetary policy interactions which seem to be supported by this result (World Bank, 1994; Easterly 1999 and ECOWAS 2008). The evidence provided by the seigniorage result superimposes further support to this view. In general, the group result provides robust support to this hypothesis. The composite index shows that fiscal policy distortion accounts for the largest cost of sustaining monetary union in the zone given the over 72 percent contribution to the expected total cost.

With respect to the benefits of monetary union in the zone, the results show that variations exist among the integrating countries. The composite index result indicates that the trade gains is more for Sierra Leone and The Gambia while Ghana and Sierra Leone have the highest potential benefit of the financial and capital market effects. More also, the associated gain from policy coordination induced by policy coordination and harmonization in a monetary union arrangement is higher for Ghana and The Gambia. There are plausible reasons and factors that account for this. First, economic agents behave in response to incentives and futuristic expectations. Second standard economic theory suggests that economic and monetary integration bring about redistribution of resources in favour of least endowed nation.

The result indicates that over 41 percent of the total trade creation benefits can be traced to Sierra Leone while Gambia share of trade accounted for about 39 percent. In particular, trade creation benefit of joining monetary union constitutes about 19.5 percent for Ghana while Nigeria accounts for the lowest share. Although Nigeria is one of the most trade open and integrated countries in the region, monetary unification of the zone could induce redistribution of trade gains from richer countries to poorer countries due to trade and supply response (Vina,

1950). Economic theory of trade creation presupposes that when economies become more open, trade would flow from resource rich region to regions with lower natural resource endowments. Intuitively, smaller countries (The Gambia and Sierra Leone) with relatively market sizes measured by population may enjoy substantially trade creation benefit due to monetary union. The overtly large expected trade creation benefit for the region as revealed by the group composite index provides balance support to this hypothesis. This result is at variance with the prediction of Debrun, Masson and Pattillo (2005) but consistent with the findings of Nnanna, *et al.* (2007) and Balogun, (2008)

However, there are visible observations in the result particularly in relation to the financial and capital market gain. The results show that Ghana accounts for a high 52.2 percentage of the total benefits derivable from the financial and capital market effects of monetary integration in the zone. The (CI) result suggests that Sierra Leone share over 43 percent while Nigeria accounts for about 3.3 percent. In particular, The Gambia shares the lowest financial and capital market gains of integrating her financial system in the zone. To that extent, a plausible factor is that financial systems in the zone have witnessed drastic reformation since the structural adjustment programme (SAP) process was initiated in 1986. Furthermore, this could have engendered economic growth propelled by increased credit to the private sector as postulated by the supply-leading hypothesis. The composite index result is equally striking in many other ways. Ghana and Sierra Leone are under-banked economies where financial markets are rudimentary, with large sizes of financial intermediations taking place in the informal sector (Obiora, (2007)). Thus, financial market development is highly sensitive to financial integration incentives that induce positive externalities and spillovers effects on economic growth.

Although the Nigeria financial sector is one of the most integrated financial markets in sub-Saharan Africa (Obadan, 2006 and Ogunleye, 2008), the result suggests that Nigeria may be one of the lowest gainers of the financial and capital market effects of joining monetary union in WAMZ. The economic intuition is that harmonization and coordination of policies permit the flow of resources from one part of the region to the other in the form of redistribution. These results further provide robust support to the evidence in the finance literature. Economic theory maintain that as financial system become more integrated, financial resources would flow from

resource rich region to the resource deficient region where their marginal products could be very high.

Moreover, in terms of relativity, there is some measure of symmetric distribution of the expected gains of policy coordination in the zone. Evidence from the Table 5.28 indicates that the gain from policy coordination is potentially higher for Ghana and The Gambia. The composite index result suggests that about 31 percent of the total expected gains from policy coordination would beneficial to Ghana while The Gambia share over 25 percent. However, the result reveals that Nigeria and Sierra Leone recorded 21 and 22 percents respectively, of the total gains of policy coordination. It is revealing that countries with high fiscal policy distortion record may benefit more from coordinating their policies with members with relatively more efficient policy interactions. In general, poor macroeconomic policy performance induced by weak interaction between fiscal and monetary policies has been dogmatic in the zone. Arguably, country(s) with such high sub-optimal interaction like Ghana tends to use such policy environment (convergence of macroeconomic conditions) to entrench policy credibility. However, the overall benefit of policy coordination in the zone is marginal. This result confirms the findings of Debrun, Masson and Pattillo (2010) that countries with high level of fiscal policy distortion are likely to benefits marginally from the gain of policy coordination. However, this underscore the possibility of using monetary union as an agency of restraint to improve policy coordination gains (Collier, 1991).

In terms of the group evidence, the result of the composite index indicates that the cost due to fiscal policy distortion share the highest cost to any other cost element for the entire group. This recorded about 72.4 percent of the total cost of the project in the weighted index. Secondly, the cost due to loss of seigniorage or the power to create money constituted about 18.4 percent with asymmetric shock accounting a smaller magnitude of 9.2 percent. This result is consistent with the finding of Debrun, Masson and Pattillo (2005, 2010) and the prediction of Hefeker (2008). On the other hand, the result reveals that the potential trade creation benefit of adopting a common policy framework is substantially high. This accounts for about 89 percent of the total benefit of forming a monetary union in the West African monetary zone. This result seems to be at variance with the prediction of Debrun, Masson and Pattillo (2005) but consistent with the finding of Nnanna, *et al.* (2007) and Balogun, (2008). Moreover, the index shows that the

financial and capital market benefit of monetary unification in WAMZ is quite marginal. The CPI reveals that the financial integration gain shares only 9 percent while policy coordination constitutes about 2 percent of the total benefits. It is evident also from the result of the composite index that the potential benefit of the project is higher than the expected total cost of forming a monetary union in WAMZ.

Data Calibration

Table 5.29: Real Value of Net-Benefit

Country	Index of Total Benefit	US $'bil (PPP) 2008	Total Benefit US$	Index of Total Cost	US $'bil (PPP) 2008	Total Cost US$	Real Net-Benefit US$
Gambia	**1.31**	**2.3**	**3.013**	**0.29**	**2.3**	**0.667**	**2.346**
Ghana	**1.36**	**34.0**	**46.240**	**1.24**	**34.0**	**42.160**	**4.080**
Nigeria	**0.33**	**338.1**	**111.573**	**0.30**	**338.1**	**101.430**	**10.143**
Sierra/L	**1.68**	**4.3**	**7.224**	**0.45**	**4.3**	**1.935**	**5.289**
WAMZ	**2.53**	**378.7**	**958.111**	**1.76**	**378.7**	**666.512**	**291.599**

** (PPP) was obtained from the World Development Indicator

Arguably, the overall net-benefit result in Table 29 (nominal value) indicates that monetary union would be beneficial though the degree of benefits could vary. While some members may witness high net-benefit, some may have marginal benefit in aggregate. The result reveals that Sierra Leone is likely to have the highest expected net-benefit followed by The Gambia. Ghana and Nigeria have the third and fourth position in the ranking scale.

However, to obtain a metric for assessing the real value of this result, we utilized the 2008 GDP purchasing power parity (PPP) from the World Bank development indicator to compare the net-benefits. The choice of 2008 is influenced by the relative good performance of these countries with their convergence criteria in 2008. The deflated result in Table 5.29 shows that Nigeria is expected to benefit largely than any other member followed by Sierra Leone and Ghana while The Gambia has the lowest net-benefit. More also, the result suggests that the overall net-benefit for the group would also be positive and relatively high in magnitude. This result further provide corroborative evidence to the earlier findings that monetary union in WAMZ would be beneficial (Soyibo, 1998, Ogunkola, 2001, 2005; Ogunkola and Jerome 2005 and Balogun, 2008) and refute the views that monetary union including Nigeria may be very costly (Debrun, Masson and Pattillo, 2005).

5.5 Discussion of Results

In this sub-section, the results of the hypotheses were evaluated in relation to the objectives of the study. In order to provide a clearer synthesis of the discussion, each objective was situated with stylised facts of the results against the findings of other studies.

5.5.1 Objective One: Estimate the costs of a common currency in WAMZ

This objective was investigated first, by identifying the three elements of costs of monetary union, asymmetric shock, loss of siegniorage and fiscal policy distortion. Second was developing some set of behavioural models and applying the vector autoregressive (VAR) procedure and the ordinary least square method in both the individual country and group (balance panel) regression analysis to estimate these models. The major hypothesis was to ascertain whether there are costs and if they differ among the members.

The asymmetric shock model results reveal that the response of exchange to terms of trade shock is higher for Sierra Leone and Ghana, and lower for Nigeria among the integrating countries. However, the panel result for the group shows that the cost of monetary union due to asymmetric shock is marginally smaller than that of Ghana and Sierra Leone. As established earlier, asymmetry results from the differences in trade relations and structural bottlenecks in supply of the integrating countries. External shock in the zone is largely a derivative of the undiversified export base couple with high imports dependency ratio in Ghana and Sierra Leone. Accordingly, the presence of asymmetric shock in the terms of trade implies that exchange rate could be very costly to lose given that exchange rate is a critical instrument for domestic adjustment during recessionary periods. The economic intuition is that the larger the degree of response in exchange rate to terms of trade shocks, the more costly it may be for the countries to give up independent exchange rate by joining a monetary union.

The composite index showed that the cost due to the loss of siegniorage and independent monetary policy would be higher for Ghana followed by Sierra Leone and Nigeria while The Gambia will have the lowest cost. This result confirms the earlier findings that Ghana is one of the countries in Africa that relies so much on money creation due to fluctuating weak revenue base, which could in principle, be costly to lose independent monetary policy. Apparently, weak and fluctuating stream of revenue are often the reason for relying on money creation. Lack of

economic development is the main factor that accounts for weak revenue base in WAMZ. It is equally revealing that seigniorage loss accounts for one of the most common and highest costs to some members of the region. Giving up monetary policy autonomy means that the individual countries would not have the policy discretion to create money needed for adjustments during recession.

Interestingly, the result further reveals that the cost due to fiscal policy distortion is equally higher for Ghana followed by Sierra Leone. Disposition to money creation to finance adverse current account balance, public domestic debt and fiscal deficit are the main source of fiscal policy distortion in the zone particularly Ghana. While money creation and fiscal deficit are the main cause of policy distortion in Ghana and Nigeria, adverse current account balance is largely a significant cause of fiscal policy distortion in Sierra Leone. The external sector of these nations faces balance of payment disequilibrium. For instance, Nigeria is an oil rich nation whose spending pattern follows closely the behaviour of oil price and volume while Ghana strongly depends on fluctuating foreign donors and grant.

The evident provided by this finding is instructive. Fiscal policy distortion bears close nexus with fiscal dominance. Economic theory provides greater insight that in the environment of fiscal dominance, monetary policy is often ineffective (Sargent and Wallace, 1981 and Oyejide, 2005). Countries with poor fiscal policy record appear to suffer largely the potential cost of losing monetary policy autonomy. Although emphasis on fiscal policy distortion lean on the financing of deficit, its moral theoretical underpin draws from time inconsistency of monetary policy which often arise from fiscal dominance environment. Time inconsistency interfaces strongly with fiscal-monetary policy interaction. Current discussion on monetary union often play serious attention to fiscal policy record given that country(s) with high level of fiscal deficit financing mechanism may find it costly to form a monetary zone otherwise, such a union may not be sustainable. In general, the study find that fiscal policy distortion and loss of independent monetary policy autonomy would be more costly than asymmetric shock given that to the extent asymmetric shock may be important, monetary policy is required to make policy adjustments.

5.5.2 Objective Two: Estimate the benefits of monetary union in WAMZ

The study developed some behavioural models to estimate the three elements of the benefits of monetary union using the error correction based ordinary least squares technique in both the country analysis and the fixed effect model for the group panel data analysis. The three elements are the trade creation effect, the financial and capital market effect, and the gains from policy coordination. The results provide unbalance support for the hypotheses. It is evident from composite index that Sierra Leone and The Gambia are likely to benefit more from trade creation followed by Ghana. A meaningful inference that could be drawn from this scenario is that monetary integration is likely to re-direct trade flows from region with high potential market sizes to the relatively smaller region in the second West African monetary zone. Such fundamentals are likely to provide robust incentive and trade response for the economies that are relatively less open. Another plausible reason is that the smaller countries interact more with each other in trade in the region (IMF-DOT, 2008). Trade interaction is highly correlated with internal and external incentives that bears link with macroeconomic environment. The peculiar oil export product of Nigeria (trade flow) goes to her major trade partners in the Europe and America region and less in the intra-ECOWAS sub-region.

Ghana and Sierra Leone enjoy more of the potential financial and capital market gains due to monetary union in the WAMZ sub-region. The increasing rate of credit to the private sector is the basic indicator that is inducing finance led growth in the countries. More fundamentally, increasing financial globalization propelled by monetary integration is the driving force. Nigeria is, however, less likely to benefit from the financial and capital market gains of forming a monetary union in WAMZ compared to other countries. Natural wisdom agrees that the Nigeria financial and capital market is one of the most integrated financial markets in Africa as evident in the portfolio and foreign direct investment (FDI) inflows. Nigeria has implemented series of financial sector reform that propelled her on the path of economic growth trajectory since the structural adjustment programme (SAP) in 1986 and the financial system strategy policy thrust of the NEEDS document 2003 and 2006. Nevertheless, economic theory suggests that as economies becomes more integrated, financial resources would move from resource rich region to the deficient units where their marginal products may becomes more competitive. Thus,

response to economic incentive may potentially influence the direction of financial globalization in the region.

In terms of the benefits associated with policy coordination, the (CI) result suggests that Ghana and The Gambia seem to benefit more followed by Sierra Leone. There are a lot of implications to this evidence. It can be deduced that countries with large fiscal policy distortion benefit more from the gains of policy coordination even though it may be relative. However, country(s) with fairly good fiscal policy distortion record may seem to benefit marginally from the policy coordination gains. The economic intuition of this result indicates that monetary union has the potential of underpinning price stability by reducing fiscal dominance.

Comparatively, the study reveals that the gains from trade creation are main benefit for the integrating countries of the second West African union than any other element. The individual countries results on the average, indicates that trade creation effect is universally more symmetric in terms of the benefits of forming a monetary union in the zone. Perhaps, one of the main elements and objectives of ECOWAS and WAMZ is to promote intra-regional trade through the adoption of common economic and monetary policies.

5.5.3 Objective Three: Estimate the Net-benefit of monetary union in WAMZ

The study adopted a cost-benefit technique and constructed a composite index to obtain the relative weights for the indicators or elements of costs and benefits of forming a monetary union in WAMZ. The study finds that monetary union in WAMZ has potential net-benefit for the members of the zone. Following from the current fundamentals, Sierra Leone and The Gambia would have high net-benefit while Ghana and Nigeria could have marginal net-benefits. However, economic and monetary integration in the second West African monetary zone appears to have potential net-benefit for the group.

These results suggest that monetary union has a natural compensatory mechanism where the big countries in size payoff for the smaller members. The implication of this is that size could matter in a monetary union. A striking revelation also to this evidence is the contemporary linkage of this finding with the current views in economic geography. For instance the result

indicates that monetary integration would re-direct resources from countries with relatively big market sizes in the zone such Nigeria and Ghana to smaller countries where they may be highly competitive. It is argued that economic size matters in the case of negotiating for regional integration scheme given that smaller countries may be subsumed by the spillover influence of the bigger nations or induce a positive spillovers effects. However, rules and operational guidelines are often used to define bounds for integrating countries.

Natural wisdom in the literature has proven that lack of political will among the stakeholders and policymakers due to the uncertainty about the expected costs and benefits are the impeding factors for the full effective implementation of the project. Nigeria and Ghana are the biggest stakeholders in the regional integration programme of the zone; therefore, it is likely that the degree to which these countries may contribute depends on the expected net-benefit and whether they are ready to play the big role. The big role is to use resources to redirect economic order. Thus, the overall economic implication of this finding is that the decision to proceed into an effective and functional monetary union in WAMZ, to a large extent, depends on the willingness to use monetary unification to influence economic structures of the integrating nations.

5.6 Robustness Check and Sensitivity Analysis

The models in this study were applied to different categories of data namely the time series data, the differenced data, logarithmic transformed data and the standardized form data. In the alternative scenarios, both the logarithmic transformed data and the undifferenced data provided an unbalance support for the hypotheses. A common feature with both is that their Durbin Watson statistics results were all significant with little or no improvement in the coefficient of determination particularly for the later case. However, most of the variables were in rates and negative such that taking their logarithms may not be appropriate. Interestingly, the parameter estimates of the variables were relatively too small and do not represent an appropriate measure for comparing two results (see, Gujarati, 2008). Hence, the differenced time series data was utilized for analysis. This aided in solving two problems. First, the observed autocorrelation of some results have no significant effect given that the data have been differenced. Second, the error correction method equally helps in minimizing the errors of the stochastic properties of the data.

Two methodological procedures were adopted in this study. First, the behavioural models were estimated and were followed by the construction of the indices for the costs and benefits indicators. Following the behaviour of the data and the order of integration of the series, the Engel and Granger Error Correction Mechanism (ECM) was utilized to estimate the models for the individual countries while the panel econometric technique was employed for the group analysis. The parameter estimates of the equations (standardized beta coefficients) were then used to construct the relative weights for comparison. To permit comparison of estimates and maintain internal consistency, the indices were derived and transformed to percentage forms within specific element of costs and benefits for the countries and across elements for the group.

For the panel data regression analysis, two alternative scenarios fixed and random effect model of the cross-sections were proposed and tested (Hausman test). The random effect method was not tenable because the number of cross-sections was less than the number of parameters. Thus, the fixed effect method permitted the test hypothesis with a good measure of degree of freedom.

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter contains the conclusion of the study on the analysis of the costs and benefits of a common currency for the second West African Monetary Zone (WAMZ). Arising from the findings in this study some policy lessons were also drawn as well as the agenda for future research.

6.1 Summary

This study provided a theoretical and empirical analysis of the costs and benefits of adopting a common monetary policy and a single currency for the second West African monetary zone (WAMZ). The growing wave in the globalization of economies across the world through capital flows as well as the increasing othodoxy of regionalism across the globe has continued to raise critical issues on the pros and corns of these developments and how best to manage them. One of such great debates and concerns is about what policy strategies or options could enhance optimal interaction between fiscal and monetary policies, which has continue to drive research focus and policy attention on monetary union. A growing body of theoretical and empirical analyses on monetary union, including the European monetary union (EMU), the Scandinavian Currency Union (SCU), the MERCOSUR and that of the different blocks of regional schemes in Africa demonstrates the strong tide and emphases on economic and monetary unions. Monetary union conjures the decision to abandon independent monetary policy autonomy against common monetary policy architecture. From policy and academic perspectives, a major question that needs an answer is; why joining a monetary union. There is preponderance of evidences in the literature, though with dearth of empirical based studies for the second West African Zone. This has continued to threaten full implementation of the project and serves as a motivation for the study.

The study utilized a hybrid of the traditional optimum currency area theory and the new views of optimum currency area theory to provide a reasoned theoretical construct for the analysis. It identified the elements of costs and benefits of monetary union and quantified them using econometric methodology. Small independent macro-behavioural models for each of the elements were developed and estimated using the Error Correction Model based Ordinary Least

Square (OLS) technique and panel technique for the countries' and group analyses respectively. The vector autoregressive (VAR) method was used to determine the countries' responses to shock. A composite index for weighting the costs and benefits elements from the parameter estimates of the regression analyses was developed for the cost-benefit analysis. Both the annual time series data and cross-section panel data technique spanning 1980 and 2009 were utilized for analysis.

The study was structured into six chapters. The first chapter set the agenda for the research. It articulated the problem statement, objective and research hypotheses for the study as well as the justification and scope of the study. The second chapter explored the background to the study. The study attempted to expose the general philosophy and evolution of economic and monetary integration in the Economic Community of the West African States (ECOWAS) and in particular the second West African Monetary Zone (WAMZ). In this connection, the macroeconomic background and overview of the economies of the zone were examined to provide clearer insights on the key issues relating to historical performance and assessment on economic management. This has enabled the understanding of the peculiarities and similarities of these countries proposing to adopt a common monetary policy framework. Accordingly, the trend analyses of major macroeconomic variables were situated with the stylized facts in background to illuminate the current issues relating to the costs and benefits of adopting a common currency.

In the third chapter, a comprehensive review of the related literature involving the theoretical, methodological and empirical issues were carried out. Moreover, there are replete of evidence in the literature that seem to portray conflicting ideas on theoretical, methodological and empirical views over the expected cost and benefits of joining a monetary union across the world. Though most of these studies favoured monetary union in terms of net-benefits, some provided evidence of net-loss particularly in the African monetary unions. Thus, this critical assessment of the literature enhanced the identification of these gaps and elements of cost and benefit of monetary union. The theoretical framework and methodology adopted in this study was presented in chapter four. In terms of methodology, both the individual country and group country analyses were also implemented to enhance comparison of results among the integrating countries. The data for the analysis were divided by the gross domestic products of the

participating countries as a measure of their sizes and the data were equally normalized to provide benchmark for comparing estimates.

Chapter five comprises the empirical analysis of the study. A combination of unit root tests of the time series data, normality test of the variables and the ordinary least squares and fixed effects panel least square results were presented, discussed and compared with existing findings. The stationarity properties of the data were analyzed using the Augmented Dickey-Fuller, and the Levin-Lin-Chu common unit root tests while the mean, skewness, Kurtosis and Jarque-Bera descriptive test statistics were adopted for the normality tests. The individual country based analysis and the panel group result for the costs and benefits of monetary union in WAMZ was also undertaken in this chapter.

Some of the key findings are discernable. It was evident that the countries are likely to benefit from monetary integration scheme of the zone. Trade creation potentials of the project are likely to be more favourable to Sierra Leone and The Gambia while monetary union in WAMZ has the potentials of leveraging further the financial and capital market gains particularly for Ghana. Evidence also existed for the high cost of losing of monetary policy autonomy for Ghana and Sierra Leone. In particular, fiscal policy distortion arising from the overbearing influence of fiscal dominance has provided strong signal of the potential cost of monetary union in the region. The result confirmed that Ghana has the highest cost due to fiscal policy distortion. Furthermore, it was found that asymmetric shock may not be as costly as other elements of cost unlike earlier studies emphasized. The composite index result indicates that the net-benefit of forming a monetary union in WAMZ outweighs the potential costs.

6.2 Conclusion

This study has endeavored to analyze the costs and benefits of a common currency for the second West African Monetary Zone (WAMZ). The empirical analyses are based on both the individual countries' time series and group panel data techniques. From the individual country analysis, the results provide evidence that monetary union would lead to substantial trade creation in the zone. The gains of the capital and financial market potentials of monetary union is expected to be very high for Ghana while the result reveal evidence of higher policy coordination gain for Ghana. Moreover, the result provide strong support that the expected cost due to loss of monetary policy independence is going to be high for a country like Ghana that depends so much on money creation for fiscal deficit financing.

The result also reveals an unambiguous support that cost due to fiscal policy distortion would be higher for Ghana. It is also clear that countries with long history of fiscal dominance over monetary policy may find it very costly to form a sustainable monetary union. The results suggest strong support that monetary union in the zone is likely to be beneficial to the region. For example, the result shows that monetary union in the zone has the potential of maximizing intra-region trade and enhanced policy credibility. The result found evidence of high potential trade creation benefit and huge cost due to fiscal policy distortion. Interestingly, the countries evidences also complemented the result of the group. We equally found that all the participating countries have the potential of enjoying net-benefit of the project particularly for the smaller countries in size. This therefore, suggests that monetary union could permit the redistribution and redirection of economic resources.

Based on these findings, some useful policy lessons can be drawn from this study. Asymmetric shocks should not only be the focal issue of discussion in evaluating the potential cost-benefit of monetary union. Fiscal policy distortion appears to be a peculiar case for the second monetary zone in ECOWAS. The prominence of fiscal dominance is a policy challenge not only to the individual countries but also on the sustainability of monetary unions. Fiscal policy distortion negates the effectiveness of monetary policy and influence the manipulation of monetary policy instruments. Within the context of monetary union, the environment of fiscal policy asymmetries often confers serious relevance on independent monetary policy autonomy such that it would be costly to give up. Thus, forming a monetary union with member(s) with

such tendencies implies that the cost due to loss of monetary policy sovereignty could be monumental. In consequence, the integrating countries in WAMZ should intensify effort to undertake strong macroeconomic adjustments of macroeconomic aggregates through the convergence of their policies. Furthermore, financial system reform strategies should be consolidated to ensure symmetry in the movement of capital flow (balanced financial globalization) so as to mitigate the possible negative effects of monetary union.

6.3 Policy Recommendation

The policy import of this research study suggests that the member countries of the Second West African Monetary Zone needs to:

- Strengthen their liberalization policy programme to enhance trade and financial sector homogeneity within the region.
- The region needs to widen its revenue base through diversification of their economies.
- The zone needs to undertake strong fiscal policy adjustment programme through the consolidation of fiscal expenditures against their revenue capacities.
- The union needs to fashion out a compensatory arrangement for the low net-gainers.

6.4 Limitation and Agenda for Future Research

Although economist and policymakers have made important advances in estimating the costs and benefits of adopting a common monetary policy and single central banks by regions, it is always difficult and ignoramus to claim that one piece of note such as this contain it all. Nevertheless, the models developed in this study provided a reasonable framework in analyzing the costs and benefits of forming a monetary union in WAMZ.

However, there is still room for future research. The modeling strategy of this research work focused on the economic aspect. Thus, a study involving fairly the political and social dimension of the issues is desirables for future research.

Again, the focus our study was based on macroeconomic consideration of the cost and benefit elements, it would be apposite to consider these elements from microeconomic perspective. Above all, the study did not cover the whole of the integrating countries which future research on the subject still need to consider.

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Appendix 1: Long- Run Results

The Gambia

MRRGDP= -0.002 - 0.002GRGDP -0.009OPNES + 0.003PDGDP + 0.002GDPPC + 0.008EXPGDP

[-0.35] [-1.11] [-0.27] [1.64] [0.89] [0.05]

R2= 0.18 DW=2.68

CGGDP= 9.172 + 5376MRRGDP + 0.02FDGDP - 0.13DCABGDP – 0.07PDGDP

[2.0] [1.05] [0.06] [-0.55] [-1.47]

R2= 0.18 DW= 0.93

TFLO = -8584 + 0.0002GDP - 7824OPNES - 8204POP - 0.504TFLO(-1)

[-0.77] [2.30] [1.08] [0.86] [0.20]

R2= 0.95 DW=1.69

GDPGR = -0.288 + 0.02GCPS + 0.30ITS + 0.03EXCHRT - 0.002INFL

[-0.09] [0.69] [1.11] [0.40] [0.08]

R2= 0.13 DW= 2.17

INFL = 19.6 - 0.90EXPGDP + 23.4OPNES

[1.79] [-2.41] [2.77]

R2= 0.32 DW= 1.77

- Values in parenthesis are the t-ratios

Ghana

MRRGDP= 0.001 - 0.001GRGDP + 0.005OPNES + 0.001PDGDP + 0.001GDPPC + 0.001EXPGDP

[0.03] [-0.69] [15.6] [0.40] [0.80] [0.65]

R2= 0.91 DW=1.80

CGGDP = 140.6 + 2235MRRGDP + 4.76FDGDP - 2.24CABGDP – 0.24PDGDP

[1.36] [3.88] [0.46] [-0.20] [-0.12]

R2= 0.38 DW=2.11

TFLO = -0.001 - 0.27GDP + 2.34OPNES + 0.001POP + 0.75TFLO(-1)

[-1.54] [-1.40] [0.49] [1.65] [5.51]

R2= 0.85 DW= 2.00

GDPGR = 3.39 + 0.03GCPS + 0.08ITS + 0.002EXCHRT - 0.07INFL

[0.97] [1.80] [0.20] [1.48] [-3.58]

R2= 0.48 DW= 1.70

INFL = 66.2 - 1.47EXPGDP - 0.01OPNES

[5.38] [-3.03] [-0.02]

R2= 0.25 DW= 2.12

- Values in parenthesis are the t-ratios

Nigeria

MRRGDP= -0.001 + 0.004GRGDP + 0.003OPNES + 0.01PDGDP - 0.01GDPPC + 0.001EXPGDP

[-0.83] [0.60] [1.28] [0.03] [0.38] [0.10]

R2= 0.23 DW=2.30

CGGDP= -1.97 + 20.0MRRGDP + 0.58FDGDP - 0.68CABGDP + 0.09PDGDP

[-0.75] [2.79] [2.31] [-5.71] [2.47]

R2= 0.74 DW=0.74

TFLO = -0.003 - 0.003GDP + 0.003OPNES + 29.0POP + 0.57TFLO(-1)

[-3.46] [-1.10] [5.46] [3.18] [5.99]

R2= 0.82 DW=2.56

GDPGR = 0.84 - 0.01GCPS - 0.007ITS + 0.04EXCHRT -+ 0.03INFL

[0.38] [-0.59] [-0.01] [1.78] [0.71]

R2= 0.14 DW= 1.86

INFL = 28.8 - 0.42EXPGDP + 14.6OPNES

[2.38] [-1.09] [0.82]

R2= 0.11 DW= 0.94

- Values in parenthesis are the t-ratios

Sierra Leone

MRRGDP= 0.01 - 0.01GRGDP + 0.003OPNES - 0.001PDGDP + 0.001GDPPC – 0.003EXPGDP

[2.72] [-2.97] [0.88] [-0.08] [1.72] [-0.44]

R2= 0.41 DW=1.77

CGGDP= 36.7 - 83.0MRGDP + 0.12FDGDP + 0.88DCABGDP - 0.03PDGDP

[3.75] [-0.40] [0.19] [0.92] [-0.24]

R2= 0.05 DW=0.77

TFLO = -0.003 + 0.16GDP + 0.001OPNES + 25.4POP + 0.59TFLO(-1)

[-1.38] [2.23] [5.05] [0.46] [3.61]

R2= 0.99 DW=1.28

GDPGR = -0.20 + 0.02GCPS - 0.27ITS + 0.003EXCHRT +- 0.04INFL

[-0.03] [0.53] [-0.67] [1.97] [0.17]

R2= 0.20 DW= 1.75

INFL = 76.7 - 2.59EXPGDP + 49.5OPNES

[2.43] [-1.80] [0.72]

R2= 0.11 DW= 1.35

- Values in parenthesis are the t-ratios

Appendix 11: Co integration Result

Seigniorage Equation

The Gambia: Cointegrating Vectors= MRRGDP, GRGDP, OPNES, GDPPC, PDGDP, EXPGDP				
Null Hypothesis	Alternative Hypothesis	Trace Statistics	5 percent Critical Value	Hypothesized No. of CE(s)
r=0	r=1	114.41	95.75	6
r ≤1	r=2	84.68	69.81	
r ≤2	r=3	57.78	47.86	
r ≤3	r=4	36.67	29.80	
r ≤4	r=5	19.66	15.49	
r ≤5	r=6	7.73	3.84	
Ghana: Cointegrating Vectors= MRRGDP, GRGDP, OPNES, GDPPC, PDGDP, EXPGDP				
Null Hypothesis	Alternative Hypothesis	Trace Statistics	5 percent Critical Value	Hypothesized No. of CE(s)
r=0	r=1	121.78	95.75	2
r ≤1	r=2	79.52	69.81	
r ≤2	r=3	41.22	47.86	
r ≤3	r=4	23.40	29.80	
r ≤4	r=5	8.98	15.49	
r ≤5	r=6	1.09	3.84	

Nigeria: Cointegrating Vectors= MRRGDP, GRGDP, OPNES, GDPPC, PDGDP, EXPGDP				
Null Hypothesis	Alternative Hypothesis	Trace Statistics	5 percent Critical Value	Hypothesized No. of CE(s)
r=0	r=1	126.96	95.75	2
r ≤1	r=2	75.43	69.82	
r ≤2	r=3	39.57	47.86	
r ≤3	r=4	19.72	47.86	
r ≤4	r=5	6.89	15.49	
r ≤5	r=6	0.92	3.84	

Sierra Leone: Cointegrating Vectors= MRRGDP, GRGDP, OPNES, GDPPC, PDGDP, EXPGDP				
Null Hypothesis	Alternative Hypothesis	Trace Statistics	5 percent Critical Value	Hypothesized No. of CE(s)
r=0	r=1	122.26	95.75	2
r ≤1	r=2	79.73	69.82	
r ≤2	r=3	47.83	47.85	
r ≤3	r=4	26.97	29.79	
r ≤4	r=5	8.80	15.50	
r ≤5	r=6	2.90	3.84	

Fiscal Policy Distortion Equation

The Gambia: Cointegrating Vectors = CGGDP, MRRGDP, FDGDP, CABGDP, PDGDP				
Null Hypothesis	Alternative Hypothesis	Trace Statistics	5 percent Critical Value	Hypothesized No. of CE(s)
r=0	r=1	101.78	69.82	4
r ≤1	r=2	64.79	47.85	
r ≤2	r=3	36.90	29.79	
r ≤3	r=4	16.23	15.49	
r ≤4	r=5	3.31	3.34	

Ghana: Cointegrating Vectors = CGGDP, MRRGDP, FDGDP, CABGDP, PDGDP				
Null Hypothesis	Alternative Hypothesis	Trace Statistics	5 percent Critical Value	Hypothesized No. of CE(s)
r=0	r=1	63.46	69.81	0
r ≤1	r=2	32.09	47.85	
r ≤2	r=3	18.04	29.79	
r ≤3	r=4	9.42	15.49	
r ≤4	r=5	2.83	3.84	

Nigeria: Cointegrating Vectors = CGGDP, MRRGDP, FDGDP, CABGDP, PDGDP				
Null Hypothesis	Alternative Hypothesis	Trace Statistics	5 percent Critical Value	Hypothesized No. of CE(s)
r=0	r=1	75.96	69.81	1
r ≤1	r=2	47.31	47.85	
r ≤2	r=3	27.25	29.79	
r ≤3	r=4	11.99	15.49	
r ≤4	r=5	0.90	3.84	

Sierra Leone: Cointegrating Vectors = CGGDP, MRRGDP, FDGDP, CABGDP, PDGDP				
Null Hypothesis	Alternative Hypothesis	Trace Statistics	5 percent Critical Value	Hypothesized No. of CE(s)
r=0	r=1	70.54	69.81	1
r ≤1	r=2	34.87	47.86	
r ≤2	r=3	21.09	29.79	
r ≤3	r=4	8.54	15.49	
r ≤4	r=5	3.71	3.84	

Trade Creation Equation

The Gambia: Cointegrating Vectors = TFLO, GDP, POP, OPNES				
Null Hypothesis	Alternative Hypothesis	Trace Statistics	5 percent Critical Value	Hypothesized No. of CE(s)
r=0	r=1	68.89	47.86	3
r ≤1	r=2	36.86	29.79	
r ≤2	r=3	14.90	15.49	
r ≤3	r=4	4.84	3.84	

Ghana: Cointegrating Vectors = TFLO, GDP, POP, OPNES				
Null Hypothesis	Alternative Hypothesis	Trace Statistics	5 percent Critical Value	Hypothesized No. of CE(s)
r=0	r=1	49.23	47.85	1
r ≤1	r=2	19.55	29.80	
r ≤2	r=3	7.09	15.49	
r ≤3	r=4	0.31	3.84	

Nigeria: Cointegrating Vectors = TFLO, GDP, POP, OPNES				
Null Hypothesis	Alternative Hypothesis	Trace Statistics	5 percent Critical Value	Hypothesized No. of CE(s)
r=0	r=1	60.24	47.85	1
r ≤1	r=2	28.09	29.80	
r ≤2	r=3	5.18	15.49	
r ≤3	r=4	0.13	3.84	

Sierra Leone: Cointegrating Vectors = TFLO, GDP, POP, OPNES				
Null Hypothesis	Alternative Hypothesis	Trace Statistics	5 percent Critical Value	Hypothesized No. of CE(s)
r=0	r=1	48.63	47.86	1
r ≤1	r=2	21.80	29.79	
r ≤2	r=3	7.90	15.49	
r ≤3	r=4	1.84	3.84	

Capital Efficiency Equation

The Gambia: Cointegrating Vectors = GDPGR, GCPS, ITS, EXCHRT, INFL				
Null Hypothesis	Alternative Hypothesis	Trace Statistics	5 percent Critical Value	Hypothesized No. of CE(s)
r=0	r=1	87.32	69.82	2
r ≤1	r=2	51.21	47.86	
r ≤2	r=3	19.45	29.79	
r ≤3	r=4	8.14	15.49	
r ≤4	r=5	0.01	3.84	

Ghana: Cointegrating Vectors = GDPGR, GCPS, ITS, EXCHRT, INFL				
Null Hypothesis	Alternative Hypothesis	Trace Statistics	5 percent Critical Value	Hypothesized No. of CE(s)
r=0	r=1	86.35	69.82	2
r ≤1	r=2	50.32	47.86	
r ≤2	r=3	23.61	29.97	
r ≤3	r=4	8.42	15.49	
r ≤4	r=5	0.22	3.84	

Nigeria: Cointegrating Vectors = GDPGR, GCPS, ITS, EXCHRT, INFL				
Null Hypothesis	Alternative Hypothesis	Trace Statistics	5 percent Critical Value	Hypothesized No. of CE(s)
r=0	r=1	109.90	69.82	2
r ≤1	r=2	54.97	47.85	
r ≤2	r=3	23.63	29.79	
r ≤3	r=4	9.84	15.49	
r ≤4	r=5	2.38	3.38	

Sierra Leone: Cointegrating Vectors = GDPGR, GCPS, ITS, EXCHRT, INFL				
Null Hypothesis	Alternative Hypothesis	Trace Statistics	5 percent Critical Value	Hypothesized No. of CE(s)
r=0	r=1	109.90	69.82	2
r ≤1	r=2	54.97	47.85	
r ≤2	r=3	23.63	29.79	
r ≤3	r=4	9.84	15.49	
r ≤4	r=5	2.38	3.38	

Policy Coordination Equation

The Gambia: Cointegrating Vectors = INFL, EXPGDP, OPNES				
Null Hypothesis	Alternative Hypothesis	Trace Statistics	5 percent Critical Value	Hypothesized No. of CE(s)
r=0	r=1	29.62	29.79	0
r ≤1	r=2	13.23	15.49	
r ≤2	r=3	2.3	3.84	

Ghana: Cointegrating Vectors = INFL, EXPGDP, OPNES				
Null Hypothesis	Alternative Hypothesis	Trace Statistics	5 percent Critical Value	Hypothesized No. of CE(s)
r=0	r=1	34.17	29.79	1
r ≤1	r=2	13.04	15.49	
r ≤2	r=3	0.98	3.34	

Nigeria: Cointegrating Vectors = INFL, EXPGDP, OPNES				
Null Hypothesis	Alternative Hypothesis	Trace Statistics	5 percent Critical Value	Hypothesized No. of CE(s)
r=0	r=1	25.63	29.79	0
r ≤1	r=2	12.24	15.49	
r ≤2	r=3	1.31	3.84	

Sierra Leone: Cointegrating Vectors = INFL, EXPGDP, OPNES				
Null Hypothesis	Alternative Hypothesis	Trace Statistics	5 percent Critical Value	Hypothesized No. of CE(s)
r=0	r=1	34.17	29.79	1
r ≤1	r=2	13.04	15.49	
r ≤2	r=3	0.98	3.34	