

**FEASIBILITY STUDY OF A SINGLE CURRENCY FOR WEST AFRICAN
MONETARY ZONE**

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DECLARATION

This is to certify that this thesis is the result of research undertaken by DANIEL AMOAH towards the award of the Master of Philosophy (M.Phil.) Degree in Economics in the Department of Economics, University of Ghana.

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ABSTRACT

The formation of a Monetary Union by the West African Monetary Zone has been in pursuance for more than a decade. The WAMZ is made up of six countries in West Africa; The Gambia, Ghana, Guinea, Liberia, Nigeria and Sierra Leone. One significant benefit from using a common currency is the lower costs of transactions; however member countries will lose the ability to use monetary policy to respond to different shocks. The participating countries need to converge or ultimately attain an Optimum Currency Area to mitigate the asymmetric shocks. The WAMZ has a set of Macroeconomics Convergence Criteria to be attained by its member countries before the commencement of the Monetary Union. The study assesses the performance of all the WAMZ countries based on the MCC from 2001 to 2011. The study also uses various theoretical criteria to assess the Optimum Currency Area in the WAMZ. The study further employs the exchange rate variability based on the OCA index to analyze the possibility of currency integration among three of the WAMZ's countries consisting of The Gambia, Ghana and Nigeria using time series data from 1980 to 2011. The assessment based on the MCC indicates that WAMZ is not ready to form the Monetary Union as of 2011. However, there are some convergences in the primary MCC. The results from the study also indicate that the WAMZ is not an Optimum Currency Area. The OCA index results show that the Nigerian Naira was the most stable currency in the region during the period of analysis. Furthermore, the method confirms that the WAMZ single currency (if it will be established) should start with Nigeria and Ghana, followed by The Gambia.

DEDICATION

This work is dedicated to Honorable Kofi Brako, families, friends and all those who have in diverse ways contributed to the success of this work.



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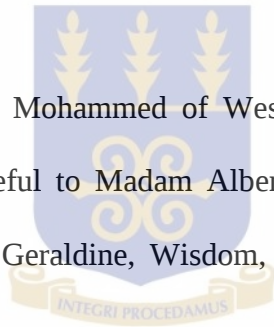


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LIST OF ABBREVIATIONS

AMU	Arab Monetary Union
ASEAN	Association of South East Asian Nations
AU	African Union
BAP	Banjul Action Plan
CIA	Central Intelligence Agency
COMESA	Common Market for Eastern and Southern Africa
CPI	Consumer Price Index
ECCAS	Economic Community of Central African States
ECOWAS	Economic Community of West African States
ECB	European Central Bank
ESCB	European System of Central Bank
EMS	European Monetary System
EMU	European Monetary Union
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GMM	Generalized Method of Moment
HIPC	Heavily Indebted poor Countries
IFS	International Financial Statistics
IMF	International Monetary Fund
MCC	Macroeconomics Convergence Criteria
SADC	South African development Community
SD	Standard Deviation
SITC	Standard International Trade Classification

OAU	Organization of African Union
OCA	Optimum Currency Area
OPEC	Organisation of Petroleum Export countries
REC	Regional Economic Communities
USA	United States of America
VAR	Vector Auto Regression
WACB	West African Central Bank
WAEMU	West African Economic and Monetary Union
WAMI	West African Monetary Institute
WAMZ	West African Monetary Zone
WDI	World Development Indicator

CHAPTER ONE

INTRODUCTION TO THE STUDY

1.0 Background to the Study

In spite of the high level of globalization, international trade, financial liberalization as well as the increasing economic integration of the world as a whole, there is still a wide range of currencies circulating in the world's economic monetary system. The International Monetary Fund with 188 member countries has more than 150 currencies.

As Mundell (1961) writes: *“If some spaceship captain came down from outer space and looked at the way international monetary relations are conducted, I am sure she would be very surprised....and wonder why more than one currency was needed to conduct international trade and payments in a world that aspired to a high degree of free trade”*.

A single currency is not new, especially in Europe as well as in other groups of African countries. For instance, the Eurozone uses the Euro as its regional currency; African Financial Community (CFA) Franc (now linked to Euro) is used by some francophone countries in Africa, Rand by the Common Monetary Area (CMA), among others.

The idea of a single or a common currency is based on the theory of an Optimum Currency Area (OCA) originally developed by Mundell (1961) and extended by Mckinnon (1963). The theory establishes certain criteria that member countries willing

to form a Monetary Union have to attain. When member countries are able to attain such criteria, it increases the economic gain for that region (member countries) to share a common currency.

An introduction of a common currency is meant to promote trade among the member countries. The member countries can only benefit from a common currency when their region can be defined as an Optimum Currency Area.

In order for member countries to benefit from a Monetary Union, they should meet some criteria (i.e. flexibility of price and wages, intra-regional factor mobility, openness to trade, product diversification, and fiscal integration (Masson and Taylor, 1993) which can help to mitigate asymmetric shock. Asymmetric shock occurs when an economic supply or demand shock is different from one region to another. For example, assuming Ghana is experiencing excess demand (under production) and Nigeria is also experiencing excess supply (unemployment) in the same period, these countries are said to be experiencing asymmetric shock. Asymmetric shock makes it difficult for the Monetary Union's Central Bank to conduct monetary policy that can solve such economic problems for both countries at the same time. A currency area with a single currency means that there is only one Central Bank that manages monetary policy in the region. This means that each member country will lose her monetary policy sovereignty. This is one of the main costs of using a common currency, a subjugation of national policy (monetary policy) to a supranational authority.

1.0.1 Background of the various Currency Unions in Africa

The unification of Africa in both monetary and political terms has been one of the objectives of the Organization of African Union (OAU) since its inception in 1963. According to Dr. Kwame Nkrumah (1963), “the first step toward our cohesive economy could be a unified monetary zone, with initially, an agreed common parity for our currency”. It is also believed that monetary union is an intermediate step towards the formation of a political union. Various steps have been taken towards the creation of a single currency in Africa under the Organization of African Union and currently the African Union (AU).

In August 2003, the Association of African Central Bank Governors agreed to work towards achieving a single currency and a common Central Bank by the year 2021. The AU’s main strategy is to establish a systematic monetary union in five existing regional economic communities. These communities are the Arab Monetary Union (AMU), Common Market for Eastern and Southern Africa (COMESA), Economic Community of Central African States (ECCAS), Economic Community of West African States (ECOWAS) and the Southern African Development Community (SADC) members (Adams 2005). Table 1.1 shows the various Regional Economic Communities and Currency Union and their member countries.

Table 1.1: Regional Economic Communities and Currency Union Membership

Regional Economic Community	Membership
Arab Monetary Union (AMU)	Algeria, Libya, Mauritania, Morocco, Tunisia
Common Market for the Eastern and Southern Africa (COMESA)	Angola, Burundi, Comoros, Democratic Republic of Congo, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Namibia, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia, Zimbabwe
Economic Community of Central African States (ECCAS)	Burundi, Cameroon, Central African Republic, Chad, Democratic Republic of Congo, Republic of Congo, Equatorial Guinea, Gabon, Rwanda, Sao Tome and Principe
Economic Community of West African States (ECOWAS)	Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, the Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo
Southern African Development Community (SADC)	Angola, Botswana, Democratic Republic of Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Tanzania, Zambia, Zimbabwe

Source: www.africa-union.org

Each of these regions is supposed to individually achieve a common currency after which they can integrate to create a common currency for the whole African continent.

One of the problems facing the African Regional Economic Community (REC) integration is the inclusion of some countries in more than one regional group (Angola, Botswana, Burundi, Democratic Republic of Congo, Malawi, Mauritius, Namibia, Seychelles, Swaziland, Rwanda, Zambia and Zimbabwe are all members of more than one REC). Different regional groups have created different timetables or stages and policies (such as intra and inter trade policies) towards the creation of a common

currency (Adams 2005). This means that member countries in the multiple regional groups will complicate and confuse the harmonization process. It will be effective if each individual country belongs to only one regional group to avoid duplication and confusion.

The stages toward the integration of African Economic Union as outlined in the Abuja Treaty in 1991 can be seen in the Table 1.2.

Table 1.2 Stages toward African Economic Integration

- | |
|---|
| <ol style="list-style-type: none"> 1. Strengthening of existing RECs and establishment of RECs where necessary (not to take more than five years). 2. Stabilisation of tariff and non-tariff barriers, customs duties and internal taxes within each REC and the strengthening of sectorial integration, particularly in the areas of trade, agriculture, finance, transport and communications, industry and energy. Harmonisation of the activities of the RECs (not to take more than eight years). 3. Establishment of free trade and customs union areas at the level of RECs with the associated harmonisation of tariff and non-tariff barriers (expected to take ten years). 4. Co-ordination and harmonisation of tariff and non-tariff systems among RECs with the movement towards a continental customs union (to take two years). 5. Establishment of an African common market and the adoption of common policies (to take four years) including the free movement of peoples. 6. Integration of economic, political, social and cultural sectors towards a single African market and a Pan-African economic and monetary union. The setting up of a single African Central Bank, single Pan-African Currency and the election of the Pan-African Parliament (to take no more than five years). |
|---|

Source: <http://www.dfa.gov.za/foreign/Multilateral/africa/treaties/aec.htm>

The Economic Community of West African States (ECOWAS) was formed in 1975 with the main objective of creating an Economic and Monetary Union for promoting economic growth and development in the West African sub-region with 16 countries. West Africa alone uses nine different currencies and most of which are inconvertible. The CFA Franc

is used in Benin, Burkina Faso, Guinea–Bissau, Cote d’Ivoire, Mali, Niger, Senegal and Togo; the Ghana Cedi for Ghana; the Dalasi for The Gambia; the Dollar in Liberia; the Leone in Sierra Leone; the Guinea Franc in Guinea; the Escudo in Cape Verde; the Ouguiya in Mauritania; and the Naira for Nigeria. The difference in currencies among the West African countries and the difficulty in converting the currencies make the cost of transaction very high hence lowering trade in the region.

As with most economic regional groups in Africa, one of the main objectives of ECOWAS is to create a Currency Union. Currently, there are two monetary regions in ECOWAS. On the 10th January, 1994 some countries within the West African sub-region founded the first monetary union called the West African Economic and Monetary Union (WAEMU) which was based on a pre-existing West African Monetary Union of CFA Franc (now at a fixed parity to the Euro). Currently, the union is made up of eight member countries which are Benin, Burkina Faso, Guinea–Bissau, Cote d’Ivoire, Mali, Niger, Senegal and Togo. All the member countries in the union are French speaking countries and the union is headquartered at Ouagadougou, the capital city of Burkina Faso.

On 20th April 2000, the Heads of State and Governments of The Gambia, Ghana, Guinea, Nigeria and Sierra Leone within the ECOWAS regional integration signed a declaration in Accra on the creation of a second monetary zone. In December 2001 the Heads of States and governments of these member countries officially launched the West African Monetary Zone (WAMZ) at Bamako. The West African Monetary Institute (WAMI) was also established with the task of setting up a West Africa Central Bank (WACB) and the

introduction of a common currency to be named ECO. In 2007, Liberia also joined the West African Monetary Zone.

According to Masson and Pattillo (2004), there are two main reasons for the enthusiasm for African monetary union and hence that of WAMZ, “first, it is clear that the Euro’s successful launch has stimulated interest in Monetary Unions in other regions....., African Monetary Union has been motivated by the desire to counteract perceived economic and political weakness”. However, it is uncertain whether the European Monetary Union has been successful or their member countries have become stronger economically than before as the union continues to experience series of financial crisis in recent times. There is the need for the WAMZ to learn from the European Monetary Union (EMU) so as not to repeat the mistakes made by the EMU in this recent time.

1.1: Problem Statement

The West African Monetary Zone, since its inception in 2001 has failed on several occasions to introduce the common currency (ECO) in the region. The launching of the union has suffered three postponements following the inadequate status of the macroeconomic convergence criteria. December 1, 2009 was the last set date for the launching but was not done since none of the countries could meet the set Macroeconomics Convergence Criteria targets. As of 2011, the state of readiness of the WAMZ countries for the Monetary Union using the Macroeconomics Convergence Criteria is not certain.

The Macroeconomics Convergence Criteria (MCC) adopted from the European Monetary Union (Maastricht Convergence criteria) is one of the ways of assessing countries with respect to the formation of a monetary union. The MCC is a “nominal convergence” rather than a “real convergence”. According to Onwioduokit (2002), the nominal convergence deals with the convergence of the development of costs and prices and their underlying determinants, while the real convergence is of working conditions and living standards and the convergence of economic institutions or structures.

The convergence of these nominal economic indicators does not necessarily mean that their real economic structures are also converging. Again, apart from the real economic convergence which is a necessary condition for the formation of a monetary union, there are other conditions proposed by the traditional Optimum Currency Area (OCA) theorists. The traditional OCA theory which has dominated the academic literature on common currency and Monetary Union has proposed series of characteristics that make a region or an area qualify for the formation of a Monetary Union. For a successful, lasting and a sustainable adoption of a single currency, some of the criteria proposed under the OCA must be taken into account. The WAMZ with her main objective of using a single currency among her member countries has not been really tested on this economic ground.

From the principal economic point of view, the OCA is the highest stage of monetary integration process. However, no existing Monetary Union has attained all the criteria of the Optimum Currency Area before the adoption of a common currency. Among member countries forming a Monetary Union, some countries if integrated might near the OCA than others. Usually, these countries are supposed to start the Monetary Union formation

before others join as to when they are ready. There has not been any empirical evidence on which countries in the WAMZ are more integrated based on the OCA criteria. Also, the countries which are likely to benefit more from the monetary union are still unknown.

1.2 Research Questions

The following research questions are paramount to the study

1. Is West African Monetary Zone ready to adopt the use of a common currency based on the Macroeconomic Convergence criteria?
2. Is West African Monetary Zone an Optimum Currency Area?
3. If the WAMZ wants to start the formation of the Monetary Union now, which of the countries should begin?
4. Which countries will benefit the most when the common currency is adopted in the West African Monetary Zone?

1.3 Objective of the Study

The study will be carried out with the aim of achieving the objectives stated in this section. This study investigates empirically, the feasibility of forming a Monetary Union in the West African Monetary Zone.

This study will specifically seek to

1. Examine the state of the preparedness of the WAMZ's member countries as at 2011, using the Macroeconomics Convergence Criteria. In particular, to assess the

WAMZ's member countries based on the set MCC targets and also examine whether empirical investigation points to the gradual convergence of these macroeconomic indicators.

2. Empirically examine the Optimum Currency Area of the WAMZ. In, particular the study investigates whether the WAMZ meets some of the conditions under the traditional Optimum Currency Area.
3. Compute the OCA index to evaluate the stability of each member country's currency in order to determine which countries can benefit the most from the Monetary Union. This evaluation is also to determine which countries can start the formation of the WAMZ monetary union.

1.4 Contributions/Significance of Study

The study will contribute to the existing literature on the adoption of a common currency in the West African Monetary Zone. Limited researches have been done on the feasibility of a common currency in the WAMZ relative to that of the EMU. The study uses a multi-criteria approach to assess the feasibility of a Monetary Union for the WAMZ. By so doing, it will increase the awareness of member countries about their progression level in achieving the Monetary Union.

As far as the methodology is concerned, the study introduces new approaches to the study of assessing the feasibility of common currency in WAMZ. A few studies have been undertaken to theoretically and empirically investigate the feasibility of a common currency in WAMZ. Most researches focus solely on the use of the Macroeconomics

Convergence Criteria with disregard to the other conditions proposed by the OCA theorists. This study closes this gap in common currency and monetary literature on WAMZ by empirically investigating the various ways of accessing an Optimum Currency Area.

Africa with its intention of creating a single currency has proposed a gradual convergence through a sub-regional Monetary Integration. Already there are existing regional monetary zones in Africa including the Common Monetary Area (CMA) and the Economic Community for Central African States (ECCAS) and among others. The findings from the study can be useful to other Regional Economics Communities in Africa.

1.6 Organisation of the Study

This study is divided into six chapters. The rest of the work is organized as follows. Chapter two looked at the overview of the West African Monetary zone. Chapter three presents a review of theoretical and empirical literature on common currency and monetary union. The methodology adopted by the study is covered in chapter four. Chapter five contains the estimations and its interpretations, analysis and evaluations, and discussions of the results. Chapter six provides a summary of the whole study and draws out policy recommendations.

CHAPTER TWO

OVERVIEW OF THE WEST AFRICAN MONETARY ZONE

2.0 Introduction

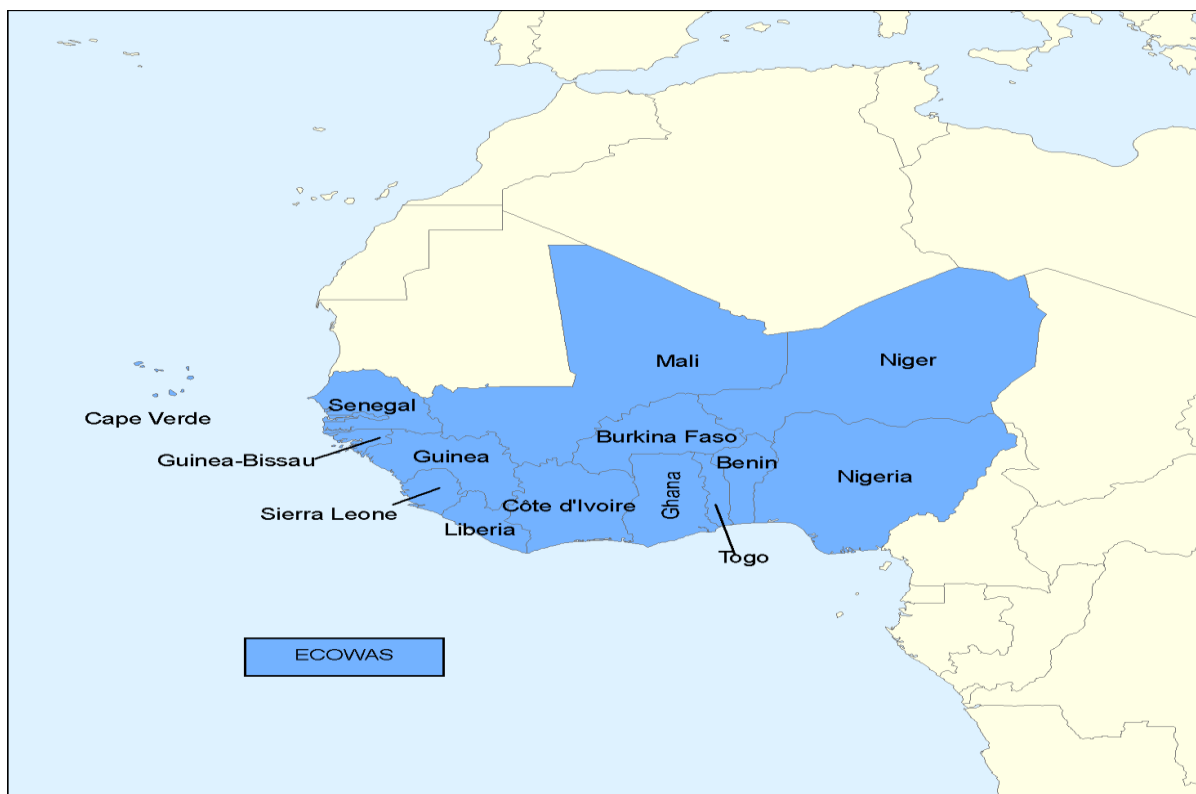
The formation of a monetary union is meant to promote trade and economic growth among the participating countries. However, factors such as geographical location, language, demography, country size, etc. of member countries have a key role to play. This chapter presents an overview of some geographic features and also the process of West African Monetary Union.

2.1 General overview of the WAMZ Countries

2.1.1 Location

The member countries of the West African Monetary Zone are located in the western part of Africa (the second largest of the seven continents on Earth). The six member countries (Gambia, Ghana, Guinea, Liberia, Nigeria and Sierra Leone) are bounded by the Atlantic Ocean in the south. Apart from the boundary connection among Guinea, Liberia and Sierra Leone, the rest of the countries in the WAMZ do not share any border with any of the member participating countries. This shows that the OCA for WAMZ will be more of economic than geographic area. The zone covers an area of about 1,603,307 km², with Nigeria being the largest (923,768 km²) and Gambia the smallest (11,295 km²). One problem is that, the WAMZ is not geographically bounded as compared to the WAEMU. Below is the geography map of Economic Community of West African States.

Figure 1.0: A geographical map of Economic Community of West African States



Source: www.wikipedia.com

Most of the WAMZ countries as shown in figure 1.0 are not geographically bounded. There the mobility of factors (labour and capital) among the WAMZ member countries is less likely to be flexible relatively to that of the West African Economic and Monetary Union.

2.1.2 Demography

Demographically, the West African Monetary Zone (WAMZ) has a numerical strength in West Africa. From the World Development Indicator, the member countries in the WAMZ have a total population of about 216.3929 million under the review period. Nigeria is the most populated country in Africa and seventh in the world. Ghana is the

second populated country in the zone with a population of about 24 million. The least populated country in the zone is Gambia with less than two million people. The density of WAMZ is about 14 persons per square kilometer. This gives an indication that the size of the WAMZ market is large enough to promote trade.

2.1.3 Language

A common language is known to be one of the factors which promote bilateral trade. There are so many indigenous languages spoken in the member countries of the West African Monetary Zone (WAMZ) which roughly correspond to the ethnic groups in the region. Examples of these local languages include; Hausa, Yoruba and Ibo in Nigeria; Akan, Mole-Dagbon and Ewe in Ghana; Peuhl and Malinke in Guinea; Mandinka, Wolof and Fulani in Gambia; Kpelle and Bassa in Liberia; and Temme and Krio in Sierra Leone. But the official languages used by the WAMZ are the English and French.

Five of the WAMZ member countries (Gambia, Ghana, Liberia, Nigeria and Sierra Leone) use English as their official language, while the remaining country (Guinea) uses French. Though the English language dominates in the zone, both French and English can be translated to one another easily. This shows that, the language barrier in the zone is not so high enough to reduce intraregional trade in the WAMZ. The Pidgin English language is also common in countries like Nigeria, Ghana and Liberia and is largely spoken by both illiterates and literates.

Table 2.0 Some selected statistics of the WAMZ countries

Country	Area	Popula- tion	GDP	GDP growth	GDP per capita	Unemp Rate	Agric- ulture	Indus try	Trade Bal.	Ext. debt
	1000 Km ²	Million	Currency \$	Annual %	Currency %	% of Labor	% of GDP	% of GDP	Million \$	% of GDP
Gambia	10.4	1.7822	3.496 b.	3.3	505.8	NA	24.5	17.4	-119.1	
Ghana	235.5	24.233	75.66b	14.4	1570.10	11	25.6	25.9	-3.675	38.2
Guinea	245.9	10.884	11.5b	1.9	497.9	NA	12.9	47.8	-1.215	2.99
Liberia	111.4	3.8878	2.432b	8.2	374.3	85	76.9	5.4	-754.3	
Nigeria	923.8	170.12	414b	7.4	1501.70	21	31.1	43	8.686	17.8
Sierra L.	71.7	5.4859	6.41b	6	374		51.7	22	-1.153	80.8

Sources: World Development Indicators, 2011

2.1.4 Relative Size of the WAMZ economies (share of GDP)

The dominant economy in the WAMZ is Nigeria, with over 81 percent of the zones' GDP. The next largest economy is Ghana with 14 percent of the zones' GDP. Liberia is the lowest economy constituting 0.4 percent of the GDP. The statistics shows that Nigeria is likely to have a major influence in the economy of the West African Monetary Union if established.

2.2 The process and status of the West African Monetary Zone

In the year 2000, the Heads of State and Government of ECOWAS approved the formation of a second sub-regional zone of economic and currency integration in West Africa. In 2001, five West African countries (Gambia, Guinea, Ghana, Nigeria and Sierra Leone) signed an agreement creating the WAMZ and establishing its operational

secretariat, the West African Monetary Institute (WAMI), in Accra. On 16th January 2010, Liberia also joined the zone.

Initially, the target date for the launch of a new common currency for the WAMZ countries was set at January 2003; this was subsequently extended to July 2005 and furthermore to December 2009. The action plan identified for each aspect of the program: the objectives, components, activities, time frame for completion and the responsibilities for implementation are captured in the Banjul Action Plan. The core activities in the Banjul Action Plan and the time frame specified is shown in table 2.1.

Table 2.1: The Banjul Action Plan

Banjul Action Plan - Benchmarks		
Programme	Minimum Requirements	Expected Completion Date
1 Macroeconomic Convergence	Attainment of all 4 Primary Criteria	March-09
2 Creation of a Customs Union	Compliance with ETLS & CET	December-08
3 Development of a Zonal Payments & Settlement System for Cross-border Transactions	Establishment of RTGS in The Gambia, Guinea and Sierra Leone	July-07
4 Statistical Harmonization & Database Development	i. National Accounts: adopt SNA 93	2009
	ii. CPI: (a) adopt COICOP	December-06
	(b) National coverage	December-08
	(c) Zone-wide harmonized index	December-08
5 Financial Sector Integration	iii. Common Macroeconomic database	2007
	i.e. Monetary aggregates	
	Zonal GDP	
	Zonal Fiscal indicators	
6 Ratification & Incorporation into National Law of the WAMZ Legal Instruments	Zonal External sector indicators	
	Enact legal instruments to ensure the following:	
	i. Full Capital Account Liberalization	December-07
	ii. Cross Listing of Stocks	December-06
7 Activation of WAMZ Institutions	iii. Regional Currency Convertibility	December-06
	Harmonization of Banking Supervision (Compliance with BCPs)	January-06
	WAMZ Agreement	December-08
	WACB Statute	December-08
8 Sensitization	WAMZ Secretariat	December-08
	WAFSA Statute	December-05
	Banking Statute	December-05
	Non-Bank Financial Institutions Statute	December-08
9 Preparation Towards the Introduction of the Eco	Growth & Convergence	January-08
	Harmonization of Financial & Company Laws	December-08
	WACB: Building & facilities	July 2009
	WAFSA	
10 Programme for Promoting Regional Development and Integration	WAMZ Secretariat	
	SCF: Retrieval of Outstanding Contributions	December-08
	Step wise approach in consonance with Action Plan	On-going
	i. Currency design	2008
9 Preparation Towards the Introduction of the Eco	ii. Vetting by member countries	2008
	iii. Introduction of Eco	December 1, 2009
10 Programme for Promoting Regional Development and Integration	i. West African Gas Pipeline	On-going
	ii. West African Highway Project	On-going
	iii. Energy Power Pool	On-going
	iv. Electricity Grid Interconnectivity	On-going
10 Programme for Promoting Regional Development and Integration	v. Improvement in Air, Transportation, Railways & Maritime transportation in the ECOWAS	On-going
		On-going

Source: WAMI 2004

It was announced that the date for the commencement of the common currency has been extended again to 2016. Despite these several postponements, these ambitious goals reflect the determination of the WAMZ countries to achieve their monetary union.

The WAMZ agreement provided for the establishment of an institution called the West African Monetary Institute (WAMI). The main principle of WAMI is to carry out functions leading to the establishment of the West Africa Central Bank (WACB) with the following objectives:

- i. Undertake all the preparations necessary for the take-off of the West African Central Bank (WACB);
- ii. Monitor and assess compliance with the convergence criteria;
- iii. Adopt price stability as its central objective and strengthen the coordination of monetary policies in order to achieve that objective;
- iv. Make the necessary preparations for the conduct of a common monetary policy;
- v. Make preparations for the issue of a common currency; and
- vi. Supervise the development of an Exchange Rate Mechanism and a West African Monetary Unit for settlements in the Zone.

The WAMI annually gives report on the progress of each of the WAMZ participating countries towards the monetary unification.

2.3 Summary

This chapter looked at various geographical and some economic features of the WAMZ participating countries and discusses the impacts of these factors on the formation of the WAMZ's monetary union. Also this chapter looked at the process and the status of the WAMZ. There are indications that systematic steps have been put in place for the formation of the WAMZ monetary union.

CHAPTER THREE

LITERATURE REVIEW

3.0 Introduction

This chapter examines the theoretical and empirical issues in the literature on common currency and monetary union. This chapter will also form the basis for the fashioning of the regression model in the next chapter.

3.1 Theoretical Literature Review

Evidence shows that economic integration promotes convergence among trading countries. Economic integration which includes monetary integration is expected to boost transaction and increase trade benefits. However, the differences in economic structures, financial liberalization, and trading systems restrain effective economic integration. Also the variations in exchange rate systems among countries constrain the monetary unification among countries. One of the conditions to be fulfilled by the member countries before currency integration is the attainment of an Optimum Currency Area (YUceol, 2006).

The main aim of economic integration is to promote trade and productivity among the member countries. Yuceol (2006) is of the view that the key element to fulfilling effective Economic integration (Monetary Union) is the attainment of an Optimum Currency Area by the member countries. He also proposed a flexible exchange regime among the member countries in a Monetary Union.

“The OCA theory is back. Once dismissed as a "dead-end problem" with little practical significance...the issue has been resuscitated and re-thought” George Tavlas (1993)

3.2.0 The concept of the Optimum Currency Area

This section elaborates on various aspect of the optimum currency area such as its definitions and explanations, costs and benefits and conditional factors.

3.2.1 Various definitions and explanations of the OCA

Theory of Optimum Currency Area (OCA) was originally propounded by Mundell (1961). In his article ‘A theory of Optimum Currency Area’, he defines OCA as an area with internal factor mobility and external factor immobility. That is, when there is a free movement of capital and labour in a particular region, that region could be termed as Optimum Currency Area. The factor mobility includes both the interregional and inter-industrial movements.

Mundell’s (1961) concept of an Optimum Currency Area with respect to internal factor mobility can be described as the best option (free trade, with perfect competition), perhaps in the ideal world. However, in the real world, a clear situation will be the absence of trade barriers. His other criteria of the OCA regarding external factor immobility (where factors of production cannot easily move from one OCA region to another), might not favour international trade in the real world. However, Mundell’s (1961) concept of OCA can be likened to a situation where the whole world integrate economically and use a common currency.

After Mundell's article in 1961 which set out the foundation of the optimum currency Area, other researchers such as McKinnon (1963) and Kenen (1969) have explored the issue of OCA concerning the degree of openness and product diversification respectively. Most of these researchers focus on the exogenous factors of the OCA. Many studies have followed suit. For example, Bayoumi (1994) provides a formalization of Mundell's analysis in a multi-region, general– equilibrium model. Recently, Alesina and Barro (2002) extended Mundell's analysis and among others.

Grubel (1970) defines a currency area as 'a territory with one or several currencies whose relative values are fixed permanently but whose common external value is determined in markets free from official intervention'. According to him, two separate nations wishing to form a currency area under a flexible exchange rate regime have to surrender some sovereignty in terms of fiscal and monetary policies to the regional central bank (supra-nation agency).

Grubel's (1970) concept on Currency Area describes another degree of economic integration (Fiscal and Monetary Union). Under this condition, member countries have to surrender their fiscal and monetary policy tools to a supra-regional Central Bank or Fiscal Authority. Grubel is not concerned with whether member countries maintain their own currency or use a common currency. The key issue is the fixed exchange rate among the member countries in the union.

Kenen (1997) also defines a currency area as 'a group of countries that undertake to contain their bilateral exchange rates within narrow bands, defined in respect of agreed central rates which they cannot change unilaterally'. According to him, a currency area is

different from a monetary union. Under the currency area, member country retains its own currency managed by the nation's central bank. The country has sovereignty over her fiscal and monetary policies and also chooses which exchange rate regime she wants to operate. But with the monetary union, there is one central bank and monetary policy for all member countries. This means that under the monetary union, the member countries lose their monetary sovereignty to a supra-nation agency.

In Kenen's (1997) view, member countries do not have to surrender their fiscal and monetary policies to another authority under the currency union. Again, what is important is the fixed exchange rate among the member countries.

A Monetary Union from both Mundell (1961) and Grubel (1970) point of view involve member countries surrendering their monetary tool to a supra regional Central Bank, however Kenen (1997) argues differently. Generally, all these authors are not concerned about whether the member countries maintain their own currencies or use a common currency in the Monetary Union. What is important is the fixed exchange rate among the member countries.

3.2.2 The Costs and Benefits of Using a Common Currency

The fundamental literature on the OCA focuses on two basic issues; the costs and benefits of adopting a common currency and the criteria member countries forming a Monetary Union need to consider. In this section, the study considers the costs and benefit of using a common currency.

According to Talvas (1993), a common currency promotes economic efficiency through a reduction of transaction cost incurred during currency convertibility. From his argument, in a situation where member countries in a Monetary Union maintain their own currencies such benefit cannot be realized. This is because there will be an opportunity cost (time) in converting currencies even though the exchange rate among member countries is fixed.

Emerson (1992) also raised another benefit which involves the reduction of foreign exchange risk and of substantial changes in relative price. Since exchange rate is fixed among member countries, there is a reduction in exchange rate risk during intra-regional trade. However, Emerson's (1992) view on the reduction in exchange rate risk can only be realized when member countries in Monetary Union trade among themselves. In a situation where member countries in a Monetary Union trade more with external countries such exchange rate risk will still be experienced.

Most of the arguments on the benefits of using a common currency to the member countries seem to depend on the degree of intra-regional trade in the Monetary Union. A Monetary Union becomes beneficial to member countries when there is a high degree of Intra-regional trade. Therefore one key factor a country needs to consider before joining a Monetary Union is the degree of trade among the member countries.

Masson and Pattilo's (2004) also summarized Mundell's idea on the costs and benefits of an Optimum Currency Area. From the summary, a common currency can save on various types of transaction costs, but a country abandoning its own currency gives up the ability to use national monetary policy to respond to asymmetric shocks. Also from the same

angle, Baldwin and Wyplosz (2006) wrote that one of the key costs involved in the formation of a common currency is the loss of monetary and exchange rate instrument in the presence of asymmetric shocks among member countries.

The arguments on the costs of using common currency seem to dwell on the loss of monetary policy and exchange rate adjustment instruments. The loss of monetary policies and exchange rate instrument however become problematic when the currency area experiences asymmetric shock. There is therefore the need for member countries forming a Monetary Union to put in measures to mitigate asymmetric shocks. In addition to the views on cost of joining a Monetary Union is the monetary contribution made by the member countries during the Monetary Union formation process. Such monetary contribution may be for the construction of various Institutions (such as regional Central Bank), development of zonal payments and settlement system, etc. Also, the free trade barrier among the member countries takes way much of the import duties which would have been realized if the members were not in a Monetary Union.

3.2.3 Some Conditions for assessing an Optimum Currency Area

In order for a region to be classified as an Optimum Currency Area, that region has to meet some criteria. The cost involved in forming a common currency can be minimized if the member countries fulfill the OCA criteria. Since countries forming a common currency lose their national monetary sovereignty, they may nevertheless be able to adapt to asymmetrical shocks, mainly through degree of product diversification, similarity in

industrial structure, fiscal transfers, and political factors. These factors are considered as the features of an OCA.

3.2.3.1 Economic Openness

The degree of economic openness among members is also very important. If the degree of openness is very high, more fluctuations in international prices of tradable are likely to be transmitted to the domestic cost of living. According to McKinnon (1963), this will reduce the potential for money and/or exchange rate illusion by wage earners. Also, from Mongelli (2008), economic openness needs to be assessed along several dimensions, including the overall openness of a country to trade with the world; the degree of openness vis-à-vis the countries with which it intends to share a single currency; the share of tradable versus non-tradable goods and services in production and consumption; and the marginal propensity to import.

From Mongelli's (2008) arguments, a country which is opened to trade with the rest of world but not with the member countries in the Monetary Union might not benefit from the union. In another way, if the degree of trade among countries forming a Monetary Union is low then the member countries are not likely to benefit.

3.2.3.2 Product Diversification

The degree of product diversity among member countries forming a currency union is very crucial. A country which exports highly diversified products is less likely to experience sector specific shock. Therefore, high diversification reduces the need for changes in the term of trade through the nominal exchange rate mechanism and provides ‘insulation’ against a variety of disturbance (kenen, 1969). Kenen’s (1969) argument on product diversification focuses on how export of variety of goods and services by a region could mitigate sector specific shocks. This is because if a country exports a variety of goods and services, a fall in demand of one product, will not affect employment so much.

To add to Kenen’s argument, countries in a Monetary Union with high degree of product diversity are also likely to trade among themselves relative to external countries. Such condition can favour balance of payment in the Monetary Zone. However, if the Monetary Union member countries are product diversified in the same sector, intra-regional trade is likely to be low. A favourable condition is when each member country in the Monetary Union is diversified in production in different sectors or sub-sectors.

3.2.3.3 Similarity in Industrial Structure

Similarity in industrial structure is also one of the factors to be considered when assessing an optimum currency area. Countries become better candidates for a currency union if they have similar industrial structures. This is because such countries will be affected by

similar sector specific shock. As a result there will be no need for a member country to unilaterally use exchange rate as an adjustment mechanism in response to terms of trade shock (Mkenda 2001).

To add to Mkenda's (2001) argument on similarity in industrial structure, if the Monetary Union is experiencing similar sectorial specific shock, it will be easier for the regional Central Bank to implement a similar policy for the all whole Union.

3.2.3.4 Political Will and Public Support

Political will among leaders is important because belonging to a currency union must involve agreeing to, for example, coordination of policies with members. Political will fosters compliance with joint commitments, sustains cooperation on various economic policies, and encourages more institutional linkages (Mongelli 2008). The issue of a currency union may not be popular among the public domain of member countries; it is up to the political leaders to convince them about the costs and benefits of joining such a monetary union.

From Mongelli's (2008) perspective, the political will and public support of member countries are needed in a Monetary Union. This argument holds because, the Heads of States and Government belonging to a Monetary Union must agree to the coordination of policies among members and also implement them. However, countries forming a Monetary Union should not allow their 'political will' to exceed the 'economic will'.

3.3 Macroeconomic Convergence

The convergence of member countries forming a monetary union is inspired by the concern that, in the presence of asymmetric shocks, macroeconomics performance, and policies may cause problems for a common monetary policy. However, the concept of convergence can be separated into two, the nominal convergence and real convergence. According to Onwioduokit (2002), the nominal convergence is of price and currency value whereas the real convergence is in terms of per capita incomes, production structures and economic activities.

A school of thought argues that since monetary policy would enforce nominal convergence in any case, nominal convergence should not be a precondition for monetary union. However, another school of thought argues that, using nominal convergence as a precondition for monetary union may *signal that economic adaptation to the single currency will not involve important challenges nor require substantial changes in the behaviour of households or firms—which may not be true if countries have very different starting points* (Masson and Rusuhuzwa, 2012). From the arguments raised above, both schools of thought agree that nominal convergence is a necessary condition for countries adopting a common currency. However, their differences come as to whether the nominal convergence should be a pre-condition or a post condition.

Macroeconomic convergence should be seen as both a precondition for monetary union membership and a permanent requirement for its successful operation (Masson, 1996). Therefore both the nominal and the real convergence should be used as a precondition for

monetary union. However, in the year 2012, an argument raised by the same author and Rusuhuzwa beg to differ a little.

Countries with lower per capita income, on average, have higher rates of inflation, suggesting that a common monetary policy may not be appropriate for rich and poor countries together. However, inflationary rates differential among member countries may be due to better institutions in richer countries, and improving of institutions is one of the anticipated benefit of a monetary union (Masson and Rusuhuzwa, 2012).

The first issue raised by these authors with respect to the need for the convergence of per capita income indicates a typical example of real convergence. The convergence of per capita income is meant to bridge the inflationary rate differential among member countries forming a Monetary Union. However, Masson and Rusuhuzwa quickly added that inflationary rate differential among countries could be as a result of institutional factors. In other words, these authors are arguing that the differences in the per capita income among countries should not hinder their Monetary Union formation since similar institutional measures can promote real convergence in the long run.

Both Masson (1996) and Masson and Rusuhuzwa, (2012) are of the view that both nominal and real convergence should be a necessary conditions for countries forming a Monetary Union. However, while Masson (1996) considered these convergence criteria as a precondition factor, in the year 2012 he and Rusuhuzwa indicated that these criteria can be considered as a post condition factor.

3.4 The Optimum Currency Area Theory

Economic literature started to develop a form of OCA theory known as the Endogenous Optimum Currency Area. The traditional OCA theory was basically concerned with the preconditions that would enable a successful Monetary Union. However, Frankel and Rose (1998) argued that many of the prerequisites for the Monetary Union, proposed by the traditional theorists, Endogenous are actually reinforced by the creation of Monetary Union. As Frankel and Rose (1998) wrote, “the examination of historical data gives a misleading picture of a country’s suitability for entry into a Monetary Union, since the OCA criteria are *endogenous*.” Again they said “the suitability of European countries for EMU cannot be judged on the basis of historical data since the structure of these economies is likely to change dramatically as a result of European Monetary Union (EMU).” This means that waiting for economies to converge before adopting the same currency is one of the ways toward attaining OCA since using a common currency will also force the economies to become an OCA. Another way can be adopting the common currency even if the region is not an Optimum Currency Area. The use of a common currency will promote trade among the members of the Monetary Union; the increase in trade will further enhance economic convergence of those countries.

The traditional OCA theorists focused on the exogenous Optimum Currency Area (OCA) concept. These theorists have generally proposed that countries forming a Monetary Union need to converge or attain the OCA criteria before formation. However, Frankel and Rose (1998) have introduced what is called the endogenous Optimum Currency. Under the concept, member countries forming a Monetary Union need not to converge

before the formation. The use of a common currency will increase trade, which will further promote economic convergence among the member countries.

3.5.0 Empirical Literature Review

In the first part of this chapter, we reviewed theoretical literature on the Optimum Currency Area and Macroeconomic Convergence. This section reviews various empirical approaches that have been used to identify the Optimum Currency Area and the Macroeconomic Convergence and also discusses the literature on the possible endogeneity of the OCA criteria.

3.5.1 Various forms of assessing the Optimum Currency Area

This section reviews empirical works, for assessing the suitability of countries forming a Monetary Union under the Optimum Currency Area Criteria proposed by various OCA theorists.

3.5.1.1 Degree of Product Diversification

Quenan and Tarija (2008) used the hirschman index for measuring the degree of product diversification among some Latin America countries. The results showed that Brazil was considered to have most diversified structure of export followed by Argentina and finally Mexico. However, no concrete conclusions were made by the author with respect to the

degree of product diversity and its implication for the suitability of the countries to form a currency union.

3.5.1.2 Degree of Openness

Mongelli (2002) assessed the optimum currency area of the European Monetary Union through the measure of the degree of openness across the euro-zone. Openness measured by the ratio of export plus import of goods and services to GDP is averaged around 46% in the euro-zone, evidencing a favourable condition for the formation of a monetary union.

Quenan and Torija in 2008 also evaluated the degree of openness between Argentina and Mexico. The result indicates that the trade between the two countries in 2005 accounted for just 1.6% of the total GDP of these two countries, far lower than the 46% of the same indicator of the euro zone. The result concludes that Mercosur is not an optimum currency area.

Rusuhuzwa and Masson (2012) also measured the degree of trade openness for five East African countries by the sum of exports and imports as a percentage of GDP. The result indicates that Kenya is the most open economy in the region followed by Tanzania, Uganda, Rwanda and Burundi. According to the authors the difference in openness may cause asymmetric shock in the region since the countries have exposure to different terms of trade. This means that the degree of openness in the region does not favour monetary unification.

3.5.1.3 Similarity of the industry structure

Mkenda (2001) used the contribution of the industries to value added to evaluate the extent of similarities in the industry sector of three countries in East Africa. The analysis indicates that the three countries have similar industrial structures, as food products and beverages accounted for the largest of value added in Kenya and Uganda. However, this share was the second largest sector in Tanzania. Further analysis also indicates that the three countries have a dominated agriculture sector with respect to both export income earning and its share to the GDP. This implies that if a shock in the price of one of the crops happens in the world market, the three countries would be affected in the same way. The findings indicate that, the similarity of the industry structure coupled with the nature of agriculture export products does not support a Monetary Unification among the East African countries.

3.5.1.4 Co- movement in economic activities

In order to assess similarities in the movement of economic activities, Mkenda (2001) correlated some economic variables, growth of output and money supply, and nominal interest rate and real interest rate among three East Africans countries. The result shows that growth of output and money supply among Kenya, Tanzania and Uganda is very low and insignificant. The results suggest that the three countries business activities do not move together, implying that they are not suitable to form a currency union. Since these

countries business activities does not move together, implementation of similar policies will be difficult by the regional Central bank in the zone.

3.5.2 The Optimum Currency Area Index

Skorepa (2011) defines an OCA index as the exchange rate pressure predicted on the basis of a regression of observed exchange rate pressure on a list of OCA indicators. If two countries are an OCA, indicators should imply an OCA index value close to zero. This is because the two economies that are an OCA do not experience any exchange rate pressure.

The OCA index was first developed by Bayoumi and Eichengreen (1997), a way of applying the core implications of the Optimum Currency Area to cross country data. This is a way of analyzing what determines nominal exchange rate variability. The OCA index estimated by Bayoumi and Eichengreen (1997) is based on a particular empirical specification that summarizes countries' readiness for European Monetary Union. The results show European countries divided into three groups: those exhibiting high level of convergence: those with a tendency to converge, and those with little or no convergence. The finding also indicates that France desire for Monetary Unification is driven by political rather than economic consideration.

Horvath and Komarek (2003) calculated OCA index for industrial countries to estimate the benefit-cost ratio of adopting a Common Currency. The result corresponded to the

estimation of Bayoumi and Eichengreen (1997) and show that the ranking of the economies stable to form a Monetary Union stays the same in the 1980s and in 1990s.

Again, Faliant (2006) used a similar method used by Bayoumi and Eichengreen (1997). Her study was based on currency union construction properties and of the calculation of an OCA index for the ASEAN-5 countries. Using both pairwise and multivariate method, the result concluded that Singapore, Malaysia and Thailand are more ready to construct currency union as compared to the other ASEAN-5 countries.

Bangake (2008) also measured an OCA index for some selected African countries. Evidence was provided concerning the link between bilateral exchange rate volatility and variables such as, size, trade intensity, sector-specific shock and disturbance to output. The result shows that in the West African Economic and Monetary Union (WAEMU), the OCA index is generally low, reflecting the structural convergence between the countries. Also there is an indication that it will be appropriate for Ghana (non CFA country) to join the WAEMU. Furthermore, a reasonable structural convergence exists among the following countries: Malawi, Zambia and Zimbabwe. This suggests that a monetary union that encompasses these countries would be beneficial. The results have important policy implication for proposed monetary union in Africa.

3.5.3 Macroeconomic Convergence

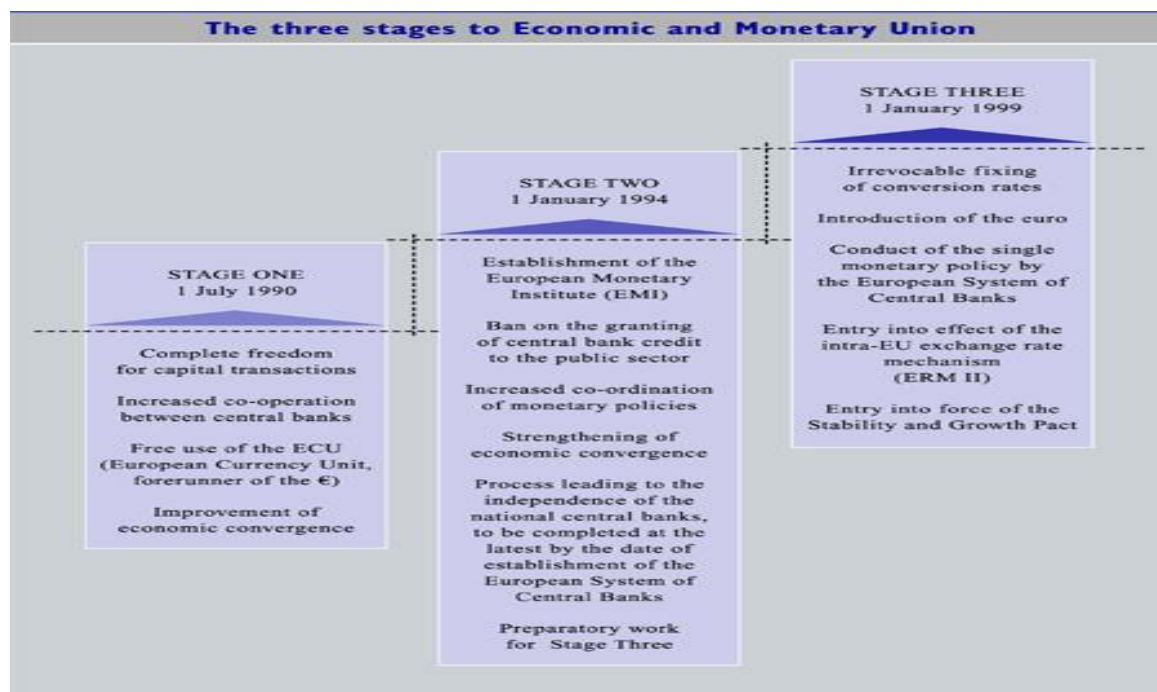
Kiyotaki and Wright in 1989 write, “Assuming Monetary Union is desired, who should be entitled to join? Insofar as the efficient advantages of a common currency are an

increasing function of the number of countries adopting it”. It is desirable that all the WAMZ countries participate in the Monetary Union. However admitting a country whose economic structure and performance (monetary and fiscal performance) is entirely different from the rest of the member countries in the Union will destabilize the Monetary Union and make it difficult for the Central Bank to achieve any specific objective especially on inflationary pressure.

3.5.4.1 The European Monetary Union Macroeconomics Convergence

In 1985, the European Commission published a white paper on the completion of the Internal Market. This was meant to enhance the free circulation of persons, goods and services, and capital in the European Union. In their 1992 Maastricht Treaty, the Union was to undergo through three phases of transition as shown in figure 3.0.

Figure 3.0: The stages to the formation of the European Monetary Union



Source: European Central Bank

In February 1992, the then European Economic Community under the Maastricht Treaty decided to specify five precondition for member countries participating in the Monetary Union. These conditions were referred to as Maastricht Convergence Criteria (MCC). Member States could only participate in the union if they could show a high degree of lasting convergence confirmed by the fulfillment of four economic criteria (inflation, long-term interest rates, fiscal debt and deficit, and exchange rates). That is, the qualification for an individual EU member state as a member for a single currency is the attainment of the Maastricht Convergence Criteria.

1. Each country's rate of inflation must not exceed 1.5% above the average of the lowest three inflation rates in the EMS;

2. Its long-term interest rates must be within 2% of the same three countries chosen for the previous condition;
3. It must have been a member of the narrow band of fluctuation of the ERM for at least two years without realignment;
4. Its budget deficit must not be regarded as 'excessive' by the European Council, with 'excessive' defined to be where deficits are greater than 3% of GDP for reasons other than those of a 'temporary' or 'exceptional' nature;
5. Its national debt must not be 'excessive', defined as where it is above 60% of GDP and is not declining at a 'satisfactory' pace.

It can be seen that formation of the European Monetary Union passed through stages from 1985 to 2002 before the commencement. Each of these stages was meant to lay a strong foundation for Monetary Unification and also for improvement of economic convergence. The WAMZ should not only focus on the attainment of the set Macroeconomic Convergence Criteria by her member countries in attaining the set but also on other factors (as per used by the EMU) to create a good foundation for the Monetary Unification.

3.5.4.1 Plausible Economic Logic behind the Maastricht Convergence Criteria

Eichengreen (1993) explained the plausible economic logic behind these convergence criteria used by the EMU as follows.

The first precondition is that a country's inflation rate should converge to a level not too far above that of the Community's low inflation countries. Specifically, the average rate of CPI inflation over the preceding 12 months must not exceed the inflation rates of the three lowest-inflation member states by more than 1.5 percentage points. The idea behind this condition is from the fact that member states have to run a very similar inflation rate under a monetary union. According to Eichengreen (1993), this result is backed by empirical evidence from the works of Wim Vanhaverbeke (1991) for Germany, that the inflation rates of states joined together in a monetary union can vary by as much as 1.5 percent a year though not persistently in one direction.

The second precondition is that nominal exchange rate must be stabilized. Qualifying countries must have maintained their exchange rate within the normal EMS fluctuation band for two years before entering the Monetary Union. This is meant to recognize the effort of the participating government for valuing and defending their exchange rate commitment. Entering a monetary union with several competitive problems may weaken the credibility of a government's commitment to the monetary union (Eichengreen 1993).

Thirdly, a qualifying country's long-term interest rates over the preceding year must have been no more than 2 percentage points above those of the three best performing member states in terms of inflation. If the second precondition is satisfied (i.e. exchange rates are credibly fixed) then interest rate cannot vary significantly except when there is a sovereign risk of default. This precondition can be rationalized if a risk of default is a threat to the monetary union (Eichengreen 1993).

The fourth precondition has to do with aligning the fiscal policy in terms of debts and deficit. According to Eichengreen (1993), budget deficits should not exceed 3% of GDP and gross public debts not exceeding 60 per-cent of GDP. The rationale behind these conditions is that if member countries being admitted into the monetary union display inadequate fiscal discipline, the ECB would be forced or compelled to pay the debt of those countries. This can cause inflation for the whole union if the debt is settled through deficit financing (Eichengreen, 1993).

The analysis by Eichengreen (1993), indicate that the convergence criteria used by the European Monetary Union has significant economic reasons. Also, the set criteria targets have both theoretical and empirical economic backing, meaning that countries who want to adopt the same approach for monetary integration must set the criteria target based on their economic backgrounds.

3.5.4.3 Plausible Economic Logic behind the MCC for the WAMZ

The Macroeconomics Convergence criteria (MCC) adopted by the WAMZ for selecting her members for the Monetary Union is not new, since similar Criteria were used by the European Union (EU). The EU set five MCC to be attained by their member countries. In the case of the WAMZ, ten MCC has been set under two groups, the primary MCC and secondary MCC, perhaps to correct the mistakes made by the EU. What is very clear is that, the set targets of the MCC by the EU are far different from the WAMZ's set targets.

The entire set MCC targets by the European Union are based on both theoretical reasons and empirical evidence.

There has not been any strong empirical evidence as to whether the set Macroeconomics Convergence Criteria targets favour all the WAMZ's member countries. However in the case of inflation, empirical evidence on the economy of Ghana and Nigeria shows that single digit inflation will not negatively affect their economies. A research conducted by Ahoritor (2011) et al for WAMI shows that the optimal inflation range for Ghana is 6-12 percent, while the one for Nigeria is 9-14 percent. These findings on optimal inflation range for the two countries suggest that inflation rate below the minimum of the optimal range could be detrimental to growth just as inflation above the range is harmful to growth. The result indicates that monetary policy in Ghana should target inflation within the estimated range of 6-12 percent, while that of Nigeria should set their inflation target within the estimated range of 9-14%. These results also confirm and conclude that both countries (Ghana and Nigeria) can comply with the single digit inflation criterion without any harmful effect on the economy of these countries.

Since Nigeria and Ghana form the larger part of the WAMZ, setting single digit inflation as the target might not cause any economic harm to the entire WAMZ. However, it is necessary for research to be conducted on the rest of the WAMZ's countries to identify whether single digit inflation favours their economy. Also, it is important for research to be conducted on the set targets for the other forms of the MCC to verify its suitability for the WAMZ's economy.

3.6 Summary

From the theoretical and empirical literature, it has become clear that countries willing to use a common currency must attain some criteria. The attainment of these criteria optimizes the economic efficiency for that region (those countries) to share a common currency. The ultimate criteria for the formation of a beneficial monetary union are for the region to attain an optimum currency area. However, convergence of some macroeconomic criteria by the participating countries can be the starting point for the commencement of the monetary union.

CHAPTER FOUR

METHODOLOGY

4.0: Introduction

The study tests the feasibility of a common currency in the West African Monetary Zone through a multi-criteria approach. Three approaches are used for this test. The first two approaches are used to test the convergence (nominal and real) of the participating member countries and also the optimum currency area of the WAMZ. These approaches are meant to determine the readiness of the WAMZ in the formation of a monetary union as at 2011 and to assess the optimality of the WAMZ currency area. The third approach is used to calculate an OCA index of the WAMZ in an effort to estimate the benefit-cost ratio of adopting a common currency and to also show the ranking of the economies suitable to form a monetary union.

This chapter provides a description of the theoretical and empirical model and the estimation method to achieve its set aims and objectives. It further specifies the choice and justification of the variables used in the model. It also provides a brief description of variables and data type and source. The organization of the chapter is laid out in the following manner. In section 4.1.1 and 4.1.2 the concept for the convergence criteria analysis are specified. Arguments for the choice and justification of the variables used in the econometric model for estimating the OCA index are made in section 4.3. Section 4.4 considers the scope and the sources of the data for the study. Finally, in section 4.5, the

estimation procedures followed in estimating the econometric OCA index model selected in section 4.3 are elaborated. The chapter ends with a conclusion.

4.1.0 Macroeconomics Convergence Criteria Approach

With the lesson learnt from the Maastricht Convergence Criteria, this section deals with how to evaluate the convergence criteria adopted by the WAMZ and other criteria proposed by the traditional OCA theorists. Some of these macroeconomics convergence criteria are nominal while others are real.

4.1.1 The Standard Convergence Criteria

As was the case with the Maastricht experience, the West African Monetary Institute has also set target for these Macroeconomics Convergence Criteria (MCC) to be attained by its member countries before the commencement of the Monetary Union. These Macroeconomics convergence criteria are divided into two groups (the primary MCC and secondary MCC). The primary MCC are the most crucial or important targets. The secondary macroeconomics convergence criteria are intended to facilitate and foster the achievement and sustenance of the primary macroeconomics criteria. These criteria will be used to evaluate the performance of the member countries of the West Africa Monetary Zone over the past decade (2001-2011). Under each of the criterion, all the participating countries are assessed to determine their individual performance over the review period. Also the convergences of these criteria among all the participating

countries are assessed by the use of mean, standard deviation and maximum differential in two periods (2001-2005 and 2006-2011). The reductions in the mean and maximum differential (best performing –worst performing country) for the two periods will be an indication of convergence among the WAMZ member countries and vice-versa.

4.1.2 The Real Convergence Approach

This is based on the ideas suggested by various OCA theorists that in the presence of asymmetric shock, application of similar macroeconomic policies may be unfavourable for some member countries in a Monetary Union. The situation becomes better when the participating countries converge on a real macroeconomic level. Countries which converge on the real macroeconomic structures are likely to experience symmetric rather than asymmetric shocks. A similar trend was used by Masson and Rusuhuzwa (2012) in assessing Common Currency Area of East African Community. YúCeol Mualla (2006) and Lee and Saucer (2008) in their separate articles assessed whether UK should join the Euro Zone using a similar approach. The real macroeconomics convergence will be dealt with under the following.

4.1.2.1 Similarities in Economic Structure of the WAMZ Member Countries

When countries are similar in terms of sectorial and export structure and per capita incomes, they are less likely to face asymmetric shocks (Masson and Rusuhuzwa, 2012). Similar economic structures among countries will mean those countries are likely

experience symmetric shocks or experience the same economic problem. This makes the implementation of monetary policies easier since such policies are meant to solve the same problem across the region. In determining the similarities in economic structure of the WAMZ's member countries, the following issues are considered.

4.1.2.2 Business Cycle Synchronization (co-movement of economic activity)

As a measure of business cycle synchronization in the WAMZ, we compute bilateral correlation coefficient between the cyclical parts of real GDP for each pair of countries over the 1980-1995 and 1996-2011 periods. The correlation coefficient gives the degree of the linear relationship between two series and its values lies between [-1:1] or [-100%:100%]. It can be seen as a measure of co-movements between two cycles and its absolute values gives the strength of association between the two series. For the business cycle synchronization, the original real GDP series are denominated in the US dollars. The Hodrick-prescott filter is applied to obtain the cyclical of the real GDP (Silva 2009).

In a monetary union, the higher the correlations of business cycles or economic activities among member countries, the lower the cost of forgoing an independent monetary policy. It also makes it easy for the Common Central Bank to implement a similar monetary policy across the zone.

4.1.2.3 The Level and Sectorial Composition of Output

Differences in sectorial output compositions of countries forming a Monetary Union could result in a situation that there will be country specific shocks causing divergence within the area in future. That is, differences in structures could make one country more vulnerable to shocks that do not affect the rest of the member countries; hence such country would react differently to changes in economic situations that in turn affect the entire union (Mkenda 2001). Similarity in output compositional structures of the participating countries will limit the extent of divergences from country-specific shocks, since they are all likely to experience symmetric shocks. Also, it makes responses to such shocks simpler.

Under this same category, we are to assess the closeness of the per capita incomes across member countries and again examine the structure of each member countries' GDP. This will be in terms of contribution by each sector to the GDP of the WAMZ member countries. It is also important to know the composition of exports of member countries. If the member countries rely on different primary commodities for export, there is a likelihood of a high level of asymmetric shocks across the region.

4.2.0 Other traditional OCA criteria

These conditions also help to determine whether the WAMZ is an optimum currency area or not.

4.2.1 Degree of Openness and Intra-regional Trade

McKinnon's trade openness criterion (1963) relates the trade-off between fixed exchange rates and flexible exchange rates to the intensity of trade relations. There is an indication that an economy that trades with the rest of the world has all the greater interest in having a fixed exchange rate the higher its trade openness rate is (Mongelli 2008). The degree of openness is meant to reduce the cost of trade and the risk of exchange rate uncertainty. The cost of discarding the exchange rate as an instrument used to adjust relative prices decreases as long as trade between the economies of member countries of the currency area is substantial. Countries that are integrated through trade may find it beneficial to adopt a common currency as their respective currencies will probably display similar movements on international markets vis-à-vis the rest of the world (Mongelli 2008).

This assessment is attained by computing the sum of export and import as a percentage of the GDP. In terms of the intra-regional trade, the export absorption by the West Africa Monetary Zone from each member country will be measured. As a benchmark, the European Union has an intra-zone trade of about 60%.

4.2.2 Product Diversification

Product diversification within the industrial sector is also an important factor favouring the formation of common currency. The more a region is diversified in the goods it produces, the less its need to adjust to external shocks using the nominal exchange rate. Therefore, a more diversified economy is a more suitable candidate for a monetary union

than a less diversified one (Kenen, 1969). The analysis on product diversification is assessed on the industry sector level, which is mostly divided in the manufacturing, mining/oil and the construction sector. This is to determine whether the industrial export products among the WAMZ member countries are diversified across the sub-industry sectors. The condition becomes favourable if the product diversification across the WAMZ is high.

4.2.3 Political Will and Public Support

Other important factors in the formation of a currency area are the political will and the public support. Member countries in a Monetary Union need to be committed to coordinate policies and to accept a loss of national (monetary) sovereignty. Also it is important for public to support the process toward a Monetary Union (Masson and Rusuhuzwa, 2012). Econometrically, it is very difficult to measure political will and public support. However, assessing the rate at which member countries of the WAMZ are complying with the Banjul Action Plan can give an idea about the political will of the WAMZ participating countries.

4.3.0 The OCA Index Approach

Various OCA theorists have proposed different Currency Union indicators. In a situation where a region attains some of the indicators but poor in others, it makes the interpretation of the mixed results very difficult. To avoid this problem an index

computed from Optimum Currency Area indicators need to be made. According to Bayoumi and Eichengreen (1997), OCA index can be defined as the prediction value of exchange rate variability, calculated using the ordinary least square (OLS) method. The smaller the OCA index, the more stable the currency. A country with smallest index indicates that her currency is the most stable among others.

The model of exchange rate variability was originally developed by Vaubel (1977). He used the model to evaluate OCA on nine countries of the European Community. In addition, OCA index has served as an indicator for measuring the benefit and cost of currency union development. A smaller OCA index indicates greater benefit to a country than its cost, and vice versa. This is because countries with high symmetric shock and trade linkage tend to have stable exchange rate volatility and therefore easy to use a single currency. Hovart (2003) improves the Bayoumi and Eichengreen (1997) model by introducing the following formula:

$$L_{ij} = a_0 + a_1BCS_{ij} + a_2FIN_{ij} + a_3DISSIM_{ij} + a_4INFL_{ij} + a_5TRADE_{ij} + a_6SIZE_{ij} + a_7OPENNESS_{ij} + \varepsilon,$$

where L_{ij} is the exchange volatility between country i and country j , i.e., the OCA index, BCS_{ij} is the business cycles synchronization, FIN_{ij} is financial growth rate, $DISSIM_{ij}$ is the dissimilarity of export commodity structure, $INFL_{ij}$ is the inflation differential, $TRADE_{ij}$ is the trade intensity, $SIZE_{ij}$ is the economic size, $OPENNESS_{ij}$ is the openness of trade, and ε is the estimation error. The subscript j represents the peg country and SD represents Standard Deviation.

4.3.1 Proxy for each of the Variable

The calculations of the variables are as follows. OCA index is calculated by drawing the deviation standard of the nominal exchange rate movements from time t to $t + 1$, i.e.,

$$L_{ij} = SD (\Delta \log e_{ij})$$

To find the value of dissimilarity of export commodity structure, we use the following formula:

$$DISSIM_{ij} = \frac{1}{T} \sum_{t=1}^T \left(|A_{it} - A_{jt}| + |B_{it} - B_{jt}| + |C_{it} - C_{jt}| \right),$$

Where A_{it} is the share of agricultural export (% of merchandise export), B_{it} is that of mining export (% of merchandise export), and C_{it} is that of manufactures export (% of merchandise export), all following the Standard International Trade classification (SITC) of country i at time t . The inflation differential is obtained by using the following formula:

$$INFL_{ij} = \frac{1}{T} \sum_{t=1}^T (\pi_{it} - \pi_{jt}),$$

where π is the consumer price index (CPI) of country i at time t . To measure the trade intensity we adopt the following approach:

$$TRADE_{ij} = \frac{1}{T} \sum_{t=1}^T \frac{ex_{ijt} + im_{ijt}}{y_{it} + y_{jt}},$$

where ex_{ijt} is the current price export from country i to country j at time t and im_{ijt} is the current price import from country j to country i at time t . The variable of economic size is determined as follows:

$$SIZE_{ij} = \frac{1}{T} \sum_{t=1}^T (\log y_{it} + \log y_{jt}).$$

The last variable --the openness of trade-- is computed by the following formula:

$$OPENNESS_{ij} = \frac{1}{T} \sum_{t=1}^T \frac{ex_{ijt} + im_{ijt}}{y_{it}}.$$

4.3.2 Justification for using USA as a peg Country

We use the US dollar as a peg country because it is the most widely used international currency and most trade in the region involved the use of US dollars. Also, the region of United States of America is theoretically and empirically considered as the most optimum currency area in the world. Achsani (2010) in measuring the OCA index for the ASEAN+3 used the US dollar as the peg currency. In the calculation of the OCA index under this category, the formula used is:

$$L_{ij} = a_0 + a_1 INFL_{ij} + a_2 DISSIM_{ij} + a_3 SIZE_{ij} + a_4 TRADE_{ij} + a_5 OPENNESS_{ij} + \varepsilon,$$

Two variables are dropped from the model because of inadequate data availability. The sub-script i represents each of the WAMZ country peg to USA with the sub-script j . Due to inadequate data available for all the WAMZ countries, we considered only three countries (The Gambia, Ghana and Nigeria)

4.3.3 Justification for using Ghana as a peg Country

Most OCA index researchers also use the most open economy within a region as a peg country. Empirically, Ghana is considered as the most open economy within the WAMZ based on the computation of the degree of openness (see figure 5.2). In the calculation of the OCA index under this category, the formula used was:

$$L_{ij} = a_0 + a_1 INFL_{ij} + a_2 SIZE_{ij} + a_3 DISSIM_{ij} + a_4 TRADE_{ij} + \varepsilon,$$

Here we drop another variable because the multicollinearity between the trade intensity and openness is extremely large. The sub-script i represents The Gambia and also Nigeria peg to Ghana with the sub-script j .

4.3.4 A Priori Expectation

The expected signs of explanatory variables are as follows: the exchange rate volatility is expected to depend positively on business cycle, positively on dissimilarity in the

commodity structure of trade, and negatively on trade intensity. The expected signs of the remaining variables are theoretically indeterminate (Horvath 2003)).

4.4 Data and Source

This research made use of secondary data from six countries, i.e., Ghana, Gambia, Guinea, Nigeria, Liberia and Sierra Leone which consist of annual time series data from 1980 to 2011. However, most of the analysis used data from 2001 to 2011. The data was compiled from the International Financial Statistics (IFS), the World Bank data base, IMF data base and the WAMI Database. Some of the data analysis was carried out using E-views 7, Stata 12 and Microsoft Excel.

4.5 Model Estimation

4.5.1 Series Unit Root Test

Macroeconomic time series are usually known to possess stochastic trends or deterministic trends indicating the presence of unit root (non-stationary); running regression with these series may yield spurious correlation. Stationarity occurs in time series when the mean, variance and autocorrelation structure of the series remain constant over time. If the variables are stationary it is said to contain no unit root (Veerbek 2004).

The unit root test is carried out to examine whether the variables being observed are stationary or not and to determine their integration. The Augmented Dickey Fuller (ADF) test was used for the test using the Eviews 7 software.

In the ADF test, the null hypothesis of non-Stationarity (has unit root) is tested against the alternative of Stationarity (has no unit root). If the ADF test fails to reject the null hypothesis in levels then the series contains unit root. We then proceed to difference the variable. If the ADF test rejects the null hypothesis in first differences, then the series contains one unit root and is integrated of order one I (1). If the test fails to reject the null test in levels and first differences but rejects the null test in second differences, then the series contains two unit roots and is of integrated order two I (2) (Verbeek 2004).

4.5.2 Augmented Dickey Fuller (ADF) Test

The procedure for testing unit root using the Augmented Dickey Fuller unit root test is laid out as follows. The ADF begins by considering a simple AR (1) process:

$$y_t = \rho y_{t-1} + x_t' \delta + \varepsilon_t \dots\dots\dots (1)$$

where y_t is the variable being tested for unit root and y_{t-1} is the lagged value of y_t . x_t are optional exogenous regressors, ρ and δ are parameters to be estimated, and the ε_t are assumed to be white noise. If $|\rho| \geq 1$, y is a non-stationary series and the variance of y increases with time and approaches infinity. If $|\rho| < 1$, y is a stationary series (Eviews 7 user guide).

The standard Augmented Dickey Fuller (ADF) unit root test as laid out by Eviews 7 user guide is carried out by subtracting y_{t-1} from both side of the equation:

$$\Delta y_t = \alpha y_{t-1} + x_t' \delta + \varepsilon_t \dots \dots (2)$$

Where $\alpha = \rho - 1$. The null and alternative hypotheses may be written as,

$$H_0 = \alpha = 0 \text{ (} y_t \text{ is non-stationary, has a unit root)}$$

$$H_1 = \alpha < 0 \text{ (} y_t \text{ stationary)}$$

The null hypothesis of the unit test in Equation 2 is rejected if the ADF test statistic is less than the ADF critical value at 5%. Rejection of the null hypothesis implies that y_t is stationary and non-rejection implies that y_t is non-stationary (Eview 7).

4.5.2 Robust Regression

Most of the researchers used the ordinary least square regression for the calculation of the OCA index. Achsani and Partisiwi (2010) and Bangake (2008), both used the ordinary least square in the computation of the OCA index.

The common estimation method in the linear regression is the least square method. However, the efficiency of the ordinary least square estimators is compromised in the presence of heteroscedasticity and outliers. Therefore highly robust statistical methods have been developed with the ability to detect outliers and heteroscedasticity. Robust estimation in econometric modifications of the basic linear regression model has been

studied only recently. Such robust methods are considered reasonable which fulfill the requirements of accurate predictions, clear interpretation, and high robustness in terms of the breakdown point, stability and low bias in parameter estimation or hypotheses testing (Kalina 2011). Wherever an ordinary least square regression is used, the robust regression can also be used to give efficient estimators. However, robust regression methods have not been supplemented by any post estimate diagnostic tools in the Stata 12. We use the Stata 12 for running the robust regression¹.

After the regression, we use the coefficients of the independent variables to compute the OCA index (dependent variables) for each year under the review period. The average OCA index is calculated for the entire period to represent the OCA index for each country with respect to the pegged country.

4.6 Summary

The chapter looked at the various ways of assessing the feasibility of the WAMZ monetary union. Annual time series data on WAMZ's participating countries are used for the study. We employ a multi criteria approaches for the assessments. The assessment of the nominal convergence is based on the set MCC target by the WAMI, while that of the real convergence is based on various factors proposed by the traditional OCA theorists. For the computation of the OCA index, robust regression is chosen over the usual ordinary least square regression. To avoid spurious regressions, the regression variables will be tested for unit root using the ADF.

¹ Detail of the robust regression can be found at <http://www.ats.ucla.edu/stat/stata/dae/rreg.htm>.

CHAPTER FIVE

ECONOMETRIC ESTIMATION AND DISCUSSIONS OF THE RESULTS

5.0 Introduction

This chapter presents the results and discussions of the econometric estimation for testing the feasibility of common currency for the West African monetary Zone. The chapter is basically organized in four sections. The first section analyzes the Nominal Macroeconomics Convergence Criteria, the second section is the estimation of the real convergence. Thirdly, other traditional OCA conditions analysis follows and finally, the computation of the OCA index.

5.1 Nominal Convergence Criteria

Each of the member country of the West African Monetary Zone was supposed to attain some macroeconomic targets on a sustainable base before the commencement of monetary union. These macroeconomic convergence criteria are in two forms, the primary and the secondary. Each of these criteria has specific targets. The tables below show the convergence criteria and their specific targets by West African Monetary Institute.

Table 5.0: Primary Macroeconomics Convergence Criteria and their set Targets

Criteria	Target
Inflation	Single Digit
Fiscal Deficit/GDP Ratio	$\leq -4\%$
Central Bank Financing of Fiscal Deficit as % of Previous Years Tax Revenue	$\leq 10\%$
Gross External Reserves/Months of Import Cover	≥ 3 months

Source: WAMI, 2011

Table 5.1: Secondary Macroeconomics Convergence Criteria and their set Targets

Criteria	Target
Non Accumulation of Domestic Arrears/Liquidation of Existing Domestic Arrears	N/A
Tax Revenue/GDP Ratio	$> 20\%$
Salary Mass/Total Tax Revenue	$< 35\%$
Public Investment from Domestic Receipts	$> 20\%$
Real Interest Rate	> 0
Exchange Rate Stability	$\pm 15\%$

Source: WAMI, 2011

“These structural criteria have to do with shoring up the infrastructure of the monetary union, which will continue after the launching of the union. The action plan therefore

stipulated minimum requirements to be put in place prior to the start of the union in December 2009. Because sound economic fundamentals are to be the basis upon which the WAMZ monetary union is to be built, developments within the economies of the member countries must be consistently monitored and reviewed". WAMI Report 2008

The WAMZ's primary macroeconomic convergence criteria include: single digit inflation; fiscal deficit/GDP ratio of not more than 4.0 per cent, central bank financing of government deficits of not more than 10.00 per cent of the previous year's tax revenue and external reserves to cover at least three months of normal imports.

5.1.1 Inflation

The target for inflation criterion is single digit and this measurement is in the nominal term. This target means that inflation rate of member countries should not exceed 9.9 percent.

The inflation here is defined as the increase in the general price based on the Consumer Price Index, between successive years. Price stability is an important economic factor for the attainment of real economic growth. The achievement of this criterion is perhaps meant to determine if macroeconomics stability can be sustained in the long run in the currency union.

Focusing on the individual member country's performance over the reference period, only two countries (Ghana and The Gambia) were able to achieve below the reference value in the year 2011. The Gambia and Ghana attained an inflation level of 5.4% and 8.6% respectively at the end of 2011. Nigeria recorded an inflation rate of 10.3%, 0.3%

above the reference value. The other three countries Liberia, Sierra Leone and Guinea attained an inflation rate of 11.5%, 16.9% and 19.0% respectively **(See figure 5.0 in appendix 1).**

Another issue was about the consistency of the member countries of achieving these macroeconomic convergence criteria targets. Over the last decade (2001-2011), there has been high level of fluctuation in inflation among most of the member countries. However, The Gambia has been able to maintain a single digit inflation consistently over the last 10 years, with the exception of 2002 (13%) and 2003 (17.6%). Ghana's inflationary record has not been so encouraging save 2010 and 2011 when she attained a single digit inflation record of 8.6% for both years. These two years have been Ghana's best inflationary record within the decade.

Inflationary rate record available for Liberia starts from 2007. The country attained single digit inflation continuously for three years from 2008 to 2010, with her best performance of 6.6% in 2010. However in 2011, Liberia recorded double digit inflation of 11.5%. Nigeria also recorded single digit inflation in only two years (2006, 2007) with the period under review. Nigeria's worst and best performance within the decade has been 23.8% (2003) and 6.6% (2007). Guinea and Sierra Leone have been the most non performing economies in terms of attaining single digit inflation in the last decade. Guinea recorded single digit inflation in the years 2001 (1.1%), 2002 (6.1%) and recently in 2009 (7.9%). Sierra Leone is the only country in the zone to have once recorded a negative single inflation of -3.1% (2002), after a single digit inflationary record of 3.4% in 2001.

However, inflation rates are clearly converging. The evidence from table 5.2 shows that broad disinflation has taking place in the zone as reflected in the reduced average inflation and the standard deviation. The dispersion reduced in all the countries except Guinea.

Table 5.2: Mean and Standard Deviation of inflation for the WAMZ

	2001-2006		2006-2011	
	Mean	Standard Deviation	Mean	Standard Deviation
The Gambia	10.3	4.9	4.5	2.5
Ghana	17.2	5.1	12.5	3.9
Guinea	15.9	12.7	18.8	10.9
Liberia	-	-	9.7	2.1
Nigeria	14.8	5.6	11.1	3.2
Sierra Leone	7.8	7.4	13.9	3.4

Source: Author's own computation, data from WAMI

Also the difference between the lowest and the highest inflation rates in WAMZ has moved from over 20% in 2001, to about 11.3% in 2008 and to 10.6% as of 2011. While only two countries achieved the single digit inflation target in 2011, the issue of monetary union is about the convergence of inflation rate. From the above it can be concluded that convergence is occurring in inflation.

5.1.2 Central Bank Financing of Fiscal Deficit

One of the sources of financing a government deficit is the central bank through the printing of money to fund the debt. In order to sustain fiscal prudence there should be a ceiling on the national central bank financing of budget deficit. This criterion seeks to limit the financing of government fiscal operations by central banks to 10.0% of previous year's tax revenue. Most of the countries under this zone have performed credibly well so far as this criterion is concerned. In 2011, all the countries in the zone were able to satisfy the criterion.

However, over the last ten years all the countries, excluding Nigeria, have not been able to sustain their performance on this criterion consistently. Gambia missed the benchmark in four of the years (2001, 2002, 2003, and 2010). The corresponding ratios for those years were: 30.7%, 76.1%, 63.1% and 27.3%, respectively. Ghana also operated outside the benchmark of 10% for three years (2002, 2004 and 2008). The corresponding ratios for those years were: 12.1%, 27.7% and 38.7 % respectively.

Liberia performed incredibly well on this criterion recording zero percent for five consecutive years (2007 to 2011). Nigeria has also performed credibly well for recording zero budget deficits financing for ten years of the reviewed period, except in 2003. The corresponding ratio for that year was 37.6%

Guinea operated outside the threshold of 10% for seven years under the reviewed period (2002, 2003, 2004, 2006, 2008, 2009 and 2010), the ratios of 27.1%, 16.1%, 23.1%, 81.6%, 16.6%, 40.1% and 82.9%. In the same period, Sierra Leone missed the target for

four years (2003, 2006, 2009 and 2010). The corresponding ratios for the years were: 24.3%, 17.9%, 21.2% and 66.7% (see figure 5.1 in appendix 1).

With the exceptions of Guinea and Sierra Leone, most of the countries are reducing or avoiding their reliance on the central bank deficit financing as shown in table 5.3.

Table 5.3: Mean and SD of Central Bank Financing of Fiscal Deficit for the WAMZ

	2001-2006		2006-2011	
	Mean	Standard Deviation	Mean	Standard deviation
The Gambia	34	35.2	4.6	11.1
Ghana	8.0	12.2	7.9	15.5
Guinea	15.0	10.8	36.9	38.1
Liberia	-	-	0.0	0.0
Nigeria	7.5	16.8	0.0	0.0
Sierra Leone	4.9	10.9	17.7	25.7

Source: Author's own computation, data from WAMI

The central bank financing of fiscal deficit has been converging gradually as seen in the reduction of the average mean for the two periods. Also, the difference between the lowest and the highest central bank fiscal deficit financing for the WAMZ has remarkably reduced from 30.7% in 2001 to 8.8% in 2011.

5.1.3 Fiscal Balance/GDP

Unfavourable fiscal balance has negative influence on monetary policy as well as the economic stability of a country as a whole. This criterion is therefore intended to evaluate government's commitment to fiscal prudence. Under this criterion, member countries' fiscal operations should not result in a deficit that is more than 4% of the GDP. This means that member countries expenditure on fiscal operations are required not to exceed 4% of the GDP.

In 2011, four countries (Ghana, Guinea, Liberia, and Nigeria) satisfied this criterion. Two countries (Gambia and Sierra Leone) failed to operate within the 4% benchmark. The difference between the best performing country (Liberia) and the worst (Sierra Leone) was 9.8%.

The mean value for fiscal balance budget ratio for 2011 was 2.7% with Liberia being the only country below the mean value by 2.5%. The rest of the countries' comparative ratios were: Gambia (7.8%), Ghana (3.0%), Guinea (3.7), Nigeria (3.1) and Sierra Leone (10%) respectively. Among all the six member countries in the zone Liberia registered fiscal surpluses for four consecutive years (2007-2010), until 2011 when she registered a comparative ratio of 0.2% **(see figure 5.3 in appendix 2).**

For the past ten years, Sierra Leone has not been able to meet the required criterion with her worst and best performance in the years 2001 (16.5%) and 2007 (5.0%) respectively. Within the same period, Ghana missed the prescribed threshold ten times showing clear level of inconsistency. Ghana has been able meet this criterion only once in the year 2011 (3.0%). Guinea operated within the threshold of less than 4% for five years (2005,

2006, 2007, 2008, and 2011). The corresponding ratios for the years were: 0.8%, 1.8%, 0.5%, 1.7%, and 3.7% respectively.

Nigeria has successfully and consistently attained this criterion for ten years within the reference period except for the year 2010 when a comparative ratio of 5.0% was recorded. Under the reference period, Gambia fell within the threshold for three continuous years (2006 to 2008). After these periods, Gambia has faltered on this criterion three consecutive years (2009, 2010 and 2011). The corresponding ratios for the years were: 7.2%, 6.7%, and 7.8%.

The fiscal balance/GDP has shown little convergence. The reduction in the mean and the dispersion for the two periods has not been too wide as shown in table 5.4.

Table 5.4: Mean and SD of Fiscal balance/GDP for the WAMZ

	2001-2006		2006-2011	
	Mean	Standard Deviation	Mean	Standard deviation
The Gambia	8.5	1.1	4.8	2.8
Ghana	8.8	2.5	7.6	2.6
Guinea	6.1	3.6	4.8	5.2
Liberia	-	-	-4.6	4.9
Nigeria	2.3	1.2	2.1	1.9
Sierra Leone	11.3	3.1	8.2	2.1

Source: Author's own computation, data from WAMI

Also the difference between the minimum and the maximum fiscal balance/ GDP of the WAMZ in 2001 is 13.3%. The same differential figure is maintained in the year 2008; however, it reduces to 9.8% in 2011. Though the rate of convergence is not so high on this criterion, there is still an element of convergence.

5.1.4 Gross External Reserve

The member countries of the WAMZ were supposed to accumulate external reserve for at least three months of import cover. This criterion was meant to enhance sustained external balance.

In 2011, the level of external reserve in the zones was adequate and above the three months required by the criterion. Nigeria and Gambia's performance on this criterion has been incredible. From 2001 to 2011 these two countries have sufficiently exceeded the required reserve.

Nigeria's best performance occurred in the year 2006 with a record of 17.3 months of gross external reserve. However, Nigeria's worst performance occurred in 2003 with a record of 4.9 months of gross external reserve. This is higher than the highest performance recorded by Guinea and Liberia under the reference periods.

Guinea has met the criterion in only three years under the reviewed period (2001, 2002 and 2011). The corresponding performances were: 4.4, 3.7 and 4.3 months of gross external reserve. Sierra Leone continuously met the criterion from 2004 to 2010.

However, in earlier years (2001 to 2003) and the latter year (2011), the country's external reserves were not adequate enough to finance up to three months of imports.

Ghana has consistently met the criterion from 2003 to 2007, missed the mark in 2008 (2.2 months of gross external reserve) and has since been on track up to 2011. However, performance in the back years (2001-2003) was inadequate (**see figure 5.4, appendix 1**).

Again the issue of convergence is very important for countries forming a monetary union. Most countries accumulated sufficient external reserves in excess of the criterion of the three months imports cover over 2006-2011. There is an increase in the average Gross external reserve for all the countries in the WAMZ except Guinea as seen in table 5.5.

Table 5.5: mean and SD of Gross External Reserves for the WAMZ

	2001-2006		2006-2011	
	Mean	Standard Deviation	Mean	Standard deviation
The Gambia	5.7	1.4	5.8	1.0
Ghana	3.5	1.5	3.7	0.9
Guinea	2.4	1.6	1.7	1.5
Liberia	-	-	2.8	1.4
Nigeria	8.5	2.9	13.4	5
Sierra Leone	2.9	1.0	4.6	1.3

Source: Author's own computation, data from WAMI

Under this criterion, it is better to measure the convergence based on the number of countries who achieved the target of the gross external reserves. In the year 2001, three

countries met the target for this criterion. While the same number of countries met this criterion in 2008, the number of countries increased to five in the year 2011.

5.2 Secondary Macroeconomics Convergence Criteria

There are six secondary convergence criteria that member countries in the WAMZ are also expected to attain in addition to the primary convergence criteria. These criteria are intended to facilitate, strengthen and sustain the achievement of the primary macroeconomics convergence. These include, non-accumulation of domestic arrears, tax revenue as a ratio of GDP of at least 20.0 percent, wage bill as a ratio of total tax revenue not to exceed 35.0%, public investment from tax receipt to exceed 20.0%, real interest rate to be positive, and exchange rate of the domestic currency to remain within a fluctuation margin of $\pm 15.0\%$

5.2.1 Zero Domestic Arrears

Data on domestic arrears for the WAMZ member countries was not available for the analysis. WAMI defines domestic arrears as expenditure relating to current budget which has been outstanding for more than 3 months. Member countries were supposed to liquidate all of their arrears by the end of 2003 and not to accumulate new ones.

5.2.2 Ratio Tax/GDP

Under this criterion, tax revenue collected by the central government as a ratio to the GDP at current market price should exceed 20.0%.

Liberia was the only country that satisfied this criterion in 2011 with a corresponding ratio of 26.4%. Ghana and Guinea recorded ratios in excess of 15% with a corresponding ratio of 15.8% and 16.6%. The three remaining countries (The Gambia, Nigeria and Sierra Leone) performed below 15%. Their corresponding ratios were: 13.3%, 12.4% and 9.3% respectively. The difference between the best performing country Liberia (26.4%) and the worst performing country Sierra Leone (9.3%) was 17.1%.

For three consecutive years (2003 to 2005), Ghana's Tax/GDP ratio exceeded 20%, after which it fell between 2006 and 2010 with an average corresponding ratio of 13.6%. However, from 2010 to 2011, Ghana's Tax/GDP ratio increased substantially by 17.7%. Gambia recorded encouraging figures from 2004 to 2008 with corresponding ratios as 18.1%, 17.8%, and 18.8 %, 19.3% and 17.9% respectively. Since then, the country's record on the tax/GDP ratio had been falling annually till 2011 when its worst performance was recorded (13%). Nigeria only satisfied this criterion in the year 2005 (22.1%) under the review period. Her worst performance was in the year 2002 when a corresponding ratio of 10.0% was recorded.

From 2001 to 2011, the performance of Sierra Leone and Guinea has not been so much encouraging. The tax/GDP ratio ranges from 7.7% to 12% for Sierra Leone and from 9.8% to 16.4 for Guinea (**see appendix 1, figure 5.6**)

Tax revenue as a percentage of GDP has shown no clear convergence. The difference between the lowest and the highest Tax Revenue/GDP in the WAMZ has moved from 5% in 2001, to about 14% in 2005, 18.1% in 2008 and to about 17.5% in 2011. Though one country met this criterion in 2011, the countries are not showing any clear signs of convergence.

5.2.3 Wage/Tax Revenue

The requirement for this criterion is that member countries should not use more than 35.0% of their tax revenue to pay wages. The wage bills include all personnel costs, that is, salaries and wages, fringe benefits and social security contributions by the government.

In 2011, only Guinea met this criterion by recording a ratio of 34.1%. Three countries (Liberia, Gambia and Ghana) recorded respective ratios of 46.1%, 45.2 and 46.1%. However, Nigeria and Sierra Leone exceeded 50% and recorded ratios of 54.6 and 58.4 respectively. The WAMZ average Wage/Tax Revenue ratio was 37.8%. Again only one country, Guinea fell below the mean ratio. The difference between the best performing country (Guinea) and the worst performing country was 26.6% in 2010. The difference declined in 2011 to 24.3% **(see appendix 1, graph table 5.7).**

Within the last decade, Nigeria has performed incredibly well especially within the years from 2003 to 2009. However, from 2010 to 2011, Nigeria missed the prescribed threshold of less than 35% with respective ratios of 39.6% and 54.6%. The Gambia operated

within the threshold from 2003 to 2009 but exceeded afterwards. Ghana and Sierra Leone are the only two countries in the WAMZ to have never operated within the criterion for the past ten years. However, Liberia has been fluctuating within the last five years by missing the criterion in two years (2009 and 2011). The corresponding ratios were: 39.9% and 46.1% respectively.

The wage/Tax Revenue in the WAMZ has not shown any progress in convergence. This criterion diverged from a maximum differential of 30.1% in 2001 to 47.6% in 2005. However, there has been a small element of convergence from 2008 with a maximum differential of 35.2% to 24.3% in 2011.

5.2.4 Public Investment/Domestic Revenue

The requisite of this criterion is that member countries' spending on public investment should exceed 20% of their tax revenue. The performance on this criterion has not been so much encouraging. In 2011, only Sierra Leone satisfied this criterion registering a ratio of 22.9%, just 2.9% above the required target. Nigeria and Ghana recorded ratios of 19.8% and 16.8% respectively. The other three countries (Guinea, Liberia and The Gambia) registered ratios below 15%. The difference between the best performing country (Sierra Leone) and the least performing country (The Gambia) was 15.6% points.

Looking back, Nigeria has performed credibly and consistently well by attaining the criterion from 2001 to 2010. However in 2011, Nigeria missed the threshold by a slim percentage of 0.2%. Ghana and Guinea met the prescribed criterion thrice in different

years. Sierra Leone has satisfied this criterion twice (2010 and 2011) registering the ratios of 42.9% and 22.9%. The Gambia had never been able to satisfy this criterion for the past ten years. The Gambia's best performing year was 2009, recording a ratio of 15.1% and conversely recording a ratio 2.5% in 2006, being the lowest ratio registered among member countries for the past decade (**see appendix 1, figure 5.8**).

Public Investment/Domestic Revenue ratios are gradually converging. The difference between the highest and the lowest Public Investment/Domestic Revenue ratios in the WAMZ has moved from over 65% in 2001 to 36% in 2005, 21.3% in 2008 and 15.6% in 2011.

Again though based on the way the criterion is stated, only one country out of six achieved the criterion in 2011, the real issue is convergence, not so much on level. However, the rate of convergence of this criterion is very slow.

With low performance on this criterion, member countries need to reform their domestic revenue generation capacity and also implement efficient public infrastructure and investment policies. Countries like Nigeria, Sierra Leone and Ghana have the prospect of attaining and sustaining this criterion in the short or medium term.

5.2.5 Real Interest Rate

The requirement for this criterion is that nominal interest rate of member countries should exceed the inflation rate. This means that the difference between savings rate and

inflation rate should be positive. The performance on this criterion has not been satisfactory.

In 2011, only one country (Gambia) met this criterion by registering a positive real interest rate of 1.4%. Five countries (Ghana, Guinea, Liberia, Nigeria and Sierra Leone) registered negative real interest rate ranging from -9.1 (Ghana) to -15.3 (Guinea). The difference between the best performing country (Gambia) and the least performing country was 11.8% points (**see appendix 1, figure 5.8**).

Retrospectively, between 2001 and 2011, Ghana failed to meet this criterion in any of the years. Within the same period, Nigeria met this criterion once in 2007 with a positive real interest rate of 1%. From 2003 to 2011, Sierra Leone also failed to meet the target in any of the years. In addition, Liberia also missed the criterion from 2007 to 2011. Gambia fell within the target threshold continuously from 2005 to 2006 and 2009 to 2011. The corresponding positive real interest rate records were: 3.2%, 4.6% and 3.3%, 0.6% and 1.4 respectively.

The real interest rates convergence has been unstable. Interest rates have converged from a maximum differential of 20.2% in 2001 to 18.2% in 2005 and 10.2% in 2008. It however diverged to 18.7% in 2011. On this criterion, both the analysis on the levels and the convergence has been unfavourable to the WAMZ.

5.2.6 Depreciation

This criterion requires that the nominal exchange rate of various member countries with respect to that of US dollar should be within the range of $\pm 15\%$. This means that the fluctuation of member countries' exchange rate should be within the margins of $\pm 15\%$.

In 2011, only two countries (The Gambia and Nigeria) operated within the range. While the Naira depreciated by 13.4%, the Dalasi appreciated by 2.2%. Three countries operated outside the band (Ghana, Guinea, and Sierra Leone). The Ghana Cedi, Guinea Franc and the Leone depreciated by 42.9%, 71.3% and 41.5% respectively (**see appendix 1, figure 5.9**).

In retrospect, Nigeria and Gambia are the only countries that have consistently satisfied this criterion within the last decade (2001-2011) apart from 2007 when the Naira appreciated by 16.1% and Dalasi by 37.3%. Ghana and Sierra Leone also met this criterion continuously from 2001 to 2007. However from 2008 to 2011, these two countries operated outside the margin. The Ghana Cedi depreciated by 27.1%, 37.9%, 37.3% and 42.9% respectively and the Leone by 15.3%, 33.55, 39.0%. and 41.5% respectively. Guinea has operated outside the required range from 2004 to 2011. Apart from 2004 when Guinea depreciated by 21.6%, the rest of the years have experienced depreciation higher than 50%.

Depreciations initially diverged from a maximum differential of 5% in 2001 to 65.5% in 2005 and to 77.8 in 2008; however convergence occurred in 2011 with a maximum differential of 73.2%. Depreciations have also shown a little convergence in the WAMZ.

5.3 The summary of the state of MCC by member countries of the WAMZ in 2011

Table 5.6: The status of primary Macroeconomics Convergence criteria in 2011

Member countries	Inflation rate	Central bank Financing of fiscal deficit	Fiscal Balance/GDP	Gross External Reserve	Total
Gambia	Yes	Yes	No	Yes	3
Ghana	Yes	Yes	Yes	Yes	4
Guinea	No	Yes	Yes	Yes	3
Liberia	No	Yes	Yes	Yes	3
Nigeria	No	Yes	Yes	Yes	3
Sierra Leone	No	Yes	No	No	1
Total	2	6	4	5	

Source: Author's own summary

In the year 2011, Ghana met all the four primary Macroeconomics Convergence Criteria. Four countries (The Gambia, Guinea, Liberia and Nigeria) met three out of the four primary Macroeconomics Convergence Criteria. Nigeria and Liberia failed to meet the inflation rate criterion while The Gambia also failed to attain the Fiscal Balance/GDP criterion. However, Sierra Leone met only one (Central Bank financing of fiscal deficit) out of the four primary Macroeconomics Convergence Criteria. In general, all the countries in the zone met the Central Bank financing of fiscal deficit criterion; five countries attained the gross external reserve criterion; four countries met the fiscal balance/GDP criterion; and lastly two countries met the inflation rate criterion.

Table 5.7: The status of Secondary Macroeconomics Convergence Criteria in 2011

Countries	Tax/GDP ratio	Wages/Tax Revenue	Public invest/Dom.Rev	Real interest	Depreciation	Total
Gambia	No	No	No	Yes	Yes	2
Ghana	No	No	No	No	No	0
Guinea	No	Yes	No	No	No	1
Liberia	Yes	No	No	No	-	1
Nigeria	No	No	No	No	Yes	1
Sierra L.	No	No	Yes	No	No	1
Total	1	1	1	1	2	

Source: Author's own summary

At the end of the reference period (2011), only Gambia met two out of the five secondary criteria. Four countries (Guinea, Liberia, Nigeria and Sierra Leone) attained one out of the five, while Ghana met none of the secondary Macroeconomics Convergence Criteria. By taking into consideration the individual criterion, two countries (The Gambia and Nigeria) met the depreciation criterion. However, the rest of the criteria had only one individual country meeting the secondary Macroeconomics Convergence Criteria.

As of 2011, none of the WAMZ member countries had attained the necessary criteria (both the primary and secondary Macroeconomics Convergence Criteria) needed to qualify for the formation of the monetary union. Ghana performed incredibly well in 2011 by meeting all the primary convergence criteria however failed to meet any of the

secondary convergence criteria. This could mean that the attainment of the primary Macroeconomics Convergence Criteria is unsustainable. The Gambia met three out of the four primary convergence criteria and two of the secondary Macroeconomics Convergence Criteria.

Nigeria, Guinea and Liberia qualified for three primary Macroeconomics Convergence Criteria and one secondary Macroeconomics Convergence Criterion. However, Sierra Leone met only one of each of the primary and the secondary Macroeconomic Convergence Criteria.

In 2005, the Banjul Declaration stated clearly that even if WAMZ member countries had achieved all the four primary Macroeconomics Convergence Criteria, the monetary union could not be launched because of the slow progress in the secondary convergence process. The issue of sustainability of the Macroeconomics Convergence Criteria is a key factor. If a country is able to achieve all the four convergence criteria in a year, it does not necessarily mean that country is qualified for the monetary union. There should be some level of consistency, perhaps for three years or more.

Table 5.8: The summary of the Classical WAMZ primary MCC before 2012

Country	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Gambia	2	1	1	3	3	4	4	4	3	2	3
Ghana	1	0	2	1	2	2	2	0	2	3	4
Guinea	3	2	0	0	2	1	2	1	1	0	3
Liberia	N.A	N.A	N.A	N.A	N.A	N.A	2	4	4	3	3
Nigeria.	3	3	3	3	3	4	4	3	3	2	3
Sierra L	2	2	0	2	2	2	2	2	1	1	1
	0	0	0	0	0	2	2	2	1	0	1
Total(no. meeting all criteria)											

Source: Author's own summary

From 2001 to 2005 none of the WAMZ countries was able to meet all the four primary Macroeconomics Convergence Criteria (MCC). However from 2006 to 2008, two countries met all the four MCC in each year. Furthermore, from 2009 to 2011 a single country was able to attain all the four MCC in each year.

The Gambia attained the entire four primary MCC three times in three continuous years (2006, 2007, and 2008); three out of the four MCC four times (2004, 2005, 2009 and 2011). Between 2004 and 2011, Gambia has performed extremely well in attainment of the primary MCC, except 2010 when only two out of the four criteria were attained. Gambia's main problem is the attainment of the Fiscal balance/GDP criterion.

Nigeria has also performed extremely well relatively to other member countries of the WAMZ. Nigeria met all the four primary MCC two continuous times (2006 and 2007) and three out of the four primary MCC eight times in the review period. However in 2010, Nigeria attained only two out of the four primary MCC and this is considered as the lowest performance in the period under review. Data for Liberia from 2007 to 2011 shows the country met all the primary MCC two continuous years (2008 and 2009).

However, the rest of the countries performance on the attainment of the primary MCC has not been so much encouraging. Ghana met the entire four primary MCC once (2011), three out of four once (2010), two out of four quadruple, one out of four twice (2001 and 2004) and finally none at all two times (2002 and 2008).

Guinea and Sierra Leone never met the all Primary MCC in any year within the reviewed period. Their performances fluctuated between zero and two out of the four MCC. Guinea's best performance has been three out of four criteria twice (2001 and 2011), while Sierra Leone's best performance is two out of the four primary convergence criteria. Inflationary pressure and a high fiscal balance/GDP are the major problems hindering these two countries progress to the formation of monetary union. These countries need to implement efficient economic measures if they really want to achieve the entire MCC in the medium term.

The secondary MCC was meant to facilitate and sustain the primary Macroeconomic Convergence Criteria. However, the results from the secondary MCC indicate a low level of performance by the WAMZ participating countries. Data was not available for domestic arrears for all the WAMZ member countries. Therefore there are five instead of

the six secondary macroeconomics convergence criteria. However, due to the political instability and the civil war which happened in Liberia, data for that country started from 2007. Also, Liberia's data on Public Investment/Domestic Revenue starts from 2009.

Table 5.9: The summary of the WAMZ Secondary MCC before 2012

COUNTRY	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
GAMBIA	1	1	1	2	3	3	1	1	3	2	2
GHANA	1	1	2	2	2	2	2	1	0	0	0
GUINEA	2	3	2	1	1	1	2	2	2	1	1
LIBERIA	N.A	N.A	N.A	N.A	N.A	N.A	2/3	2/3	¼	2/4	¼
NIGERIA	3	2	3	3	4	3	3	3	3	2	1
SIERRA L	2	2	1	1	1	1	1	0	0	1	1
TOTAL(NUMBERS MEETING ALL CRITERIA)	0	0	0	0	0	0	0	0	0	0	0

Source: Author's own summary

Under the reference period, none of the countries was able to attain all the five secondary MCC. That is, the total number of countries meeting all the criteria was zero throughout the years.

Nigeria's performance on this secondary MCC is relatively outstanding, being the only country to have met four out of the five criteria in 2004. This is the highest throughout the review period. Nigeria also met three out of five secondary MCC for seven years (2001, 2003, 2004 and 2006 to 2009). In the last two years under the review period,

Nigeria's performance has been poor. In 2010, the country met two and in 2011 one out of the five secondary MCC. Nigeria's major constraints are on the Real Interest Rate and the Tax/GDP ratio. However, the inflation targeting adopted by Nigeria if properly managed should be able to curb down the inflationary pressures and this will improve the Real Interest Rate. This country also needs to reform her tax system including the tax coverage and collection.

The Gambia attained three out of the five secondary MCC in three year (2005, 2006 and 2009) and two out of the five secondary MCC in three years (2004, 2010 and 2011). The other four countries' (Ghana, Guinea, Liberia and Sierra Leone) performance on meeting the five secondary MCC has been extremely poor. Effective economic measures such as tax reforms, inflation targeting, etc. have to be implemented if they want to qualify for the monetary union in the medium term.

Considering the macroeconomic convergence monitored by the WAMI to which the participating countries of the WAMZ have committed themselves, it is clear that they are making some progress specifically with the primary Macroeconomics Convergence Criteria. The criteria which are converging are mostly the non-fiscal-related criteria. The convergence of inflation rates is very clear and significant for the formation of a monetary union. According to Mundell (2001) *"The more closely countries are integrated; the more adjustment will be facilitated. But the overriding criterion of a workable currency area is that member countries agree on the target rate of inflation and are willing to accept the arrangements for fixing exchange rates and deciding upon the monetary policy that will bring the common target rate of inflation about."* (Cited from David 2005)

The other primary Macroeconomics Convergence Criteria such as the Fiscal Deficit/GDP ratios, Central bank deficit finance and gross external reserves are all showing a sign of convergence which is good for the formation of Currency Union by the WAMZ. However, there has not been any progress on the secondary Macroeconomics Convergence Criteria. Most of these criteria are rather diverging.

From the data and the analysis above, none of the countries have clearly met and sustain these nominal Macroeconomics Convergence Criteria. Though the participating countries are converging on the primary Macroeconomics Convergence Criteria, the rate of convergence is quite slow.

5.3 Assessment of the Optimum Currency Area of the WAMZ.

5.3.1 Co-movement of economic activity (Business Cycle Synchronization)

Annual data on real GDP growth rate is used to measure the level of business cycle synchronization among member countries of the WAMZ. The Table 5.10 shows correlations of the cyclical component of real GDP among the six WAMZ countries over 1980-1995 and 1996-2011.

Table 5.10 Business cycle synchronization (1980-1995, 1996-2011)

	Gambia	Ghana	Guinea	Liberia	Nigeria	Sierra L.
Gambia	1.000	0.99	0.99	0.99	0.99	0.99
	1*	0.99*	0.99*	-0.99*	0.99*	
Ghana	0.99	1	0.98	0.98	0.99	0.99
	0.99*	1*	0.99*	-0.99*	0.99*	
Guinea	0.99	0.99	1	0.99	0.98	0.98
	0.99*	0.99*	1*	-0.99*	0.99*	
Liberia	0.99	0.98	0.99	1	0.98	0.98
	-0.99*	-0.99*	-0.99*	1*	-0.99*	
Nigeria	0.99	0.99	0.98	0.98	1	0.99
	0.99*	0.99*	0.99*	-0.99*	1*	
Sierra L.	0.99	0.99	0.98	0.98	0.99	1.

Source: Author's own computation

Note: There are two values in each cell. The upper values (without asterisks) show the bilateral correlation coefficients of the WAMZ countries within 1996-2011 (latter period), while the lower values (with asterisks) show the bilateral correlation coefficient in the period of 1980-1995(former period).

Table 5.10 above measures the co-movement between two cycles (real GDP) and its absolute value gives the strength between the two pairing countries. The bilateral

correlation coefficients of the real GDP growth among the WAMZ's countries are very high, signifying a high level of business cycle synchronization of the WAMZ. In the latter period (1996-2011), the correlation coefficient exceeds 95% for all the pairing countries of the WAMZ. As discussed earlier, the higher the level of business cycle synchronization among member countries, the lower the level of asymmetric shocks in the region.

There is also an indication that most of the countries are converging in terms of the business cycle synchronization. From 1980 to 1995, there is a low and negative correlation coefficient between Liberia and all the other WAMZ member countries. However in the later period (1996-2011) there is a high level of convergence with Liberia and the other WAMZ member countries showing positive and significant correlation coefficients. Almost all the bilateral correlations coefficients are above 95% in the two periods. This condition makes WAMZ favourable for the formation of a monetary union.

5.3.2 The Level and Sectorial Composition of Output

By the year 2011, Ghana recorded the highest GDP per capita in West Africa with a corresponding value of \$1,570.10. Nigeria also recorded a GDP per capita of \$1,501.70 in the same year. However, the other participating countries (Gambia, Guinea, Sierra Leone and Liberia) recorded very low GDP per capita in the same year with their corresponding values \$505.8, \$497.9, \$374.3 and \$374 respectively. The average GDP per capita (2001-2011) is also similar, with Nigeria and Ghana dominating, followed by the other countries. If the GDP per capita is used as a proxy for relative standard of

living, then Nigeria and Ghana can be said to be similar in terms of GDP per capita. The other remaining countries can also be said to have a similar standard of living. It implies that, the relative standard of living across the WAMZ is not uniform, which is quite an unfavourable condition for the formation of a monetary union.

The structure of GDP in terms of the contributions of the different sectors of the economy is quite similar. Apart from Nigeria, the agriculture and service sector is dominating in the economies of the rest of the participating countries. In Nigeria, the Industry (petroleum) has been and remained the largest contributor to its output.

SECTORIAL COMPOSITION OF OUTPUT FOR GHANA AND NIGERIA (2011)

Figure 5.10

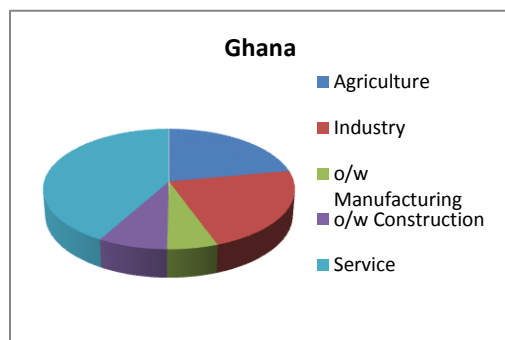
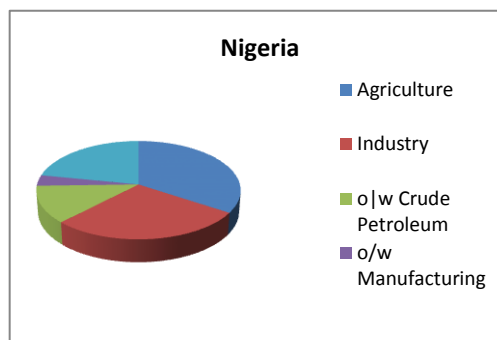


Figure 5.11

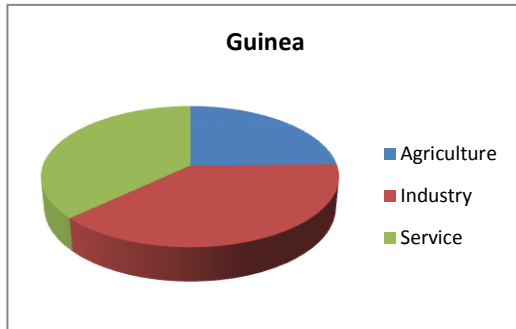


Source: Author's own constructs

The mean output share values (2001-2011) indicates that Ghana and The Gambia's economy are dominated by the service sector with a corresponding share of 42% and 59% respectively.

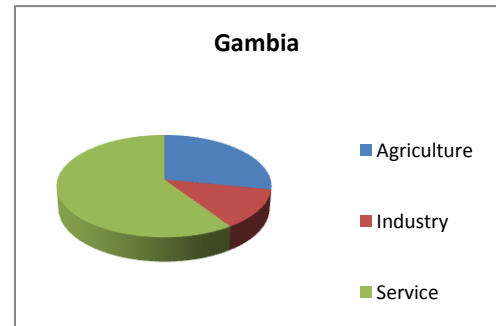
SECTORIAL COMPOSITION OF OUTPUT FOR GUINEA AND THE GAMBIA (2011)

Figure 5.12



Source; Author's own constructs

Figure 5.13



SECTORIAL COMPOSITION OF OUTPUT FOR SIERRA LEONE AND LIBERIA (2011)

Figure 5.14

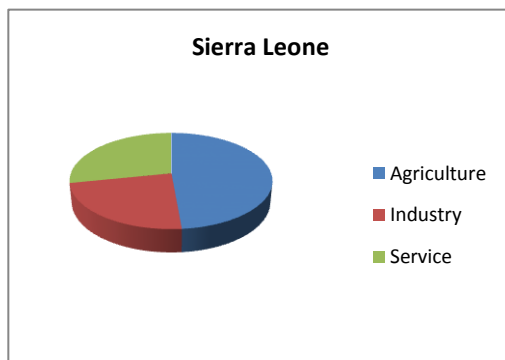
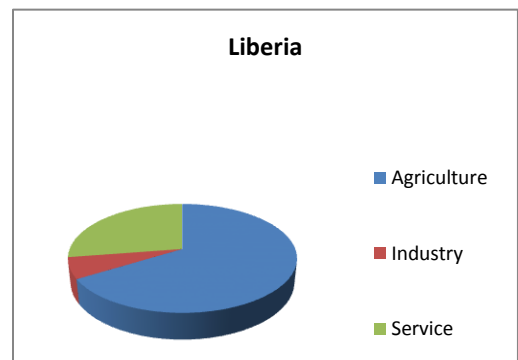


Figure 5.15



Source: Author's own constructs

The agriculture sector dominates in both Liberia (66%) and Sierra Leone's (49%) economies. However, both the industry and the service sectors compete in domination in the Guinea's economy. Ghana is likely to have a similar sectorial structure to that of Nigeria due to its recent production of oil.

The output compositional structure of the WAMZ's member countries favours Monetary Union. However, country specific shock is likely to occur in the WAMZ from Nigeria, a giant economy and an oil producing country dominated by the industrial sector.

5.3.3 Product Diversification

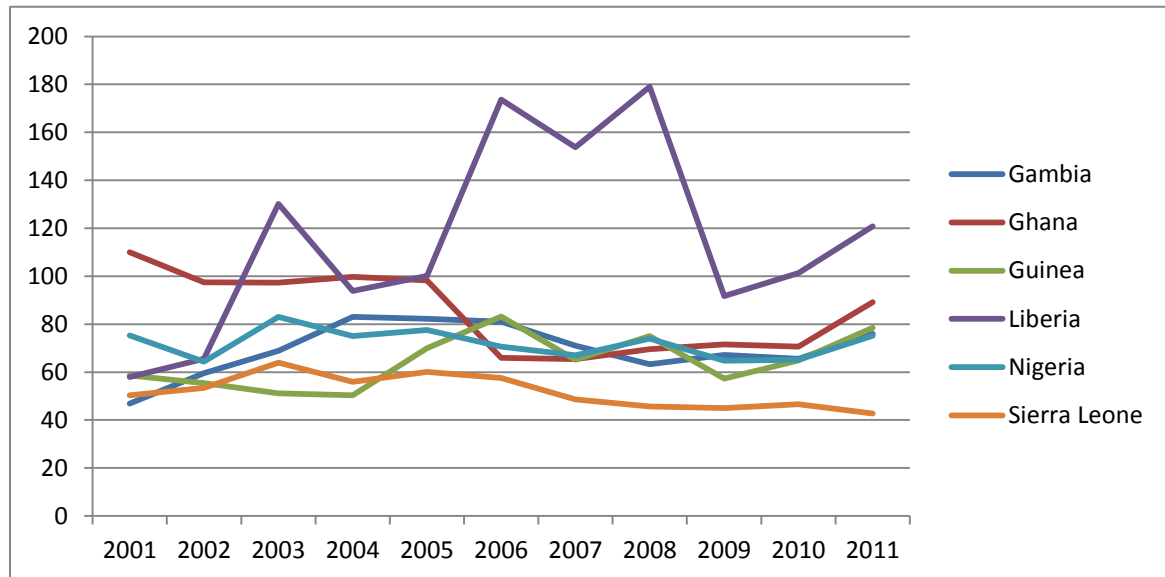
The industry sector of the WAMZ's member countries is mostly divided into three, the manufacturing, mining/oil and the construction sector. The composition of the industry products for export indicates that the zone is prone to asymmetric shocks due to the low level of industry diversity. Majority of the WAMZ member countries export more mining/oil products. Nigeria largely depends on oil (Ghana likely to join) and the other member countries (Ghana, Guinea and Sierra Leone) export gold, bauxite and diamond respectively. This condition makes it unfavourable for the formation of monetary union by the WAMZ.

5.3.4 Trade openness and Intra- regional trade

The figure 5.10 shows the trend of trade as a percentage of GDP of the WAMZ's member countries. This analysis is used to evaluate the degree of trade openness of a country. For the past decade, there is a clear indication that member countries of the WAMZ are open to external trade. The mean of trade as a percentage of GDP from 2001 to 2011 for member countries are; Gambia (70%), Ghana (85%), Guinea (65%), Liberia (110%), Nigeria (72%) and Sierra Leone (52%). The result shows that over the reviewed period,

Liberia is the most open economy to external trade, followed by Ghana. Even though Sierra Leone recorded the lowest mean it ratio exceeds 50%.

Figure 5.10: Trade as a percentage of GDP in the WAMZ

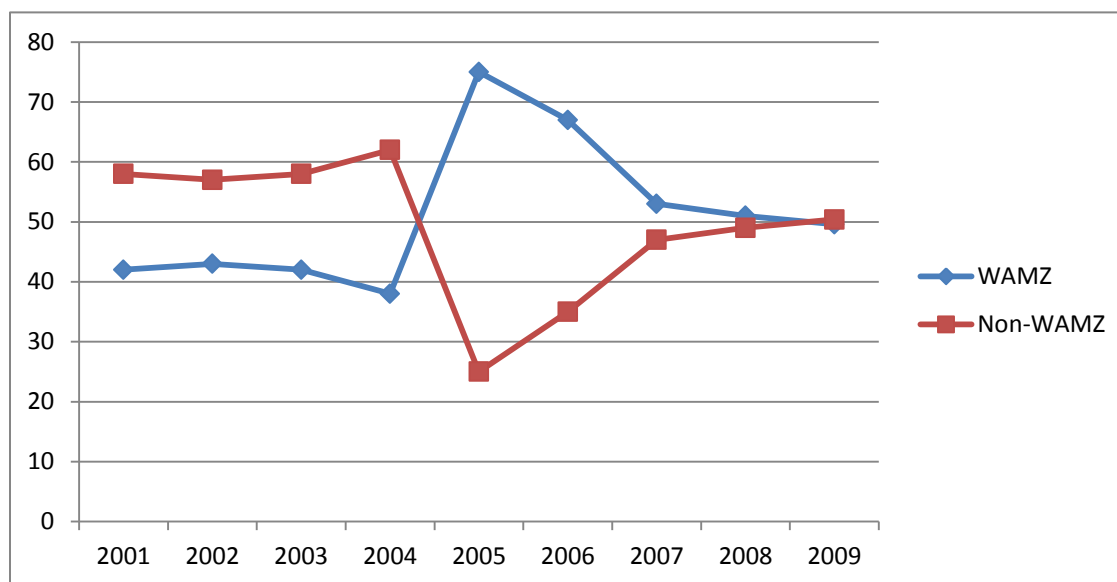


Authors own constructs, WDI 2011

However, the analysis above does not necessarily mean that member countries of the WAMZ are trading among themselves.

Intra-ECOWAS trade pattern indicates that even though the creation of the WAMZ Custom Union had not materialized as at 2009, member countries' contributions of exports to the ECOWAS have improved relative to that of the WAEMU.

Figure 5.11: Percentage Contribution of WAMZ & Non-WAMZ to Total Export in the ECOWAS (2001-2009)



Source: WAMI and ECOWAS 2009

Figure 5.11 shows the percentage contribution of WAMZ and non-WAMZ to total export in the ECOWAS. As of 2009, WAMZ was made up of five member countries excluding Liberia, while non-WAMZ was made up of the rest of the ECOWAS member countries (WAEMU and Cape Verde). From 2001 to 2004, non-WAMZ dominated the ECOWAS region with more than 50% of export. However, the trend changed onwards, from 2005 to 2008, the WAMZ dominated in the contribution to the intra-ECOWAS with a corresponding record of 75% (2005), 67% (2006), 53% (2007) and 51% (2008). The graph also shows that WAMZ contribution has been falling gradually. In 2009, the WAMZ contributed 49.6% to intra-ECOWAS exports, while the share of non-WAMZ was 50.4%. Total value of the WAMZ's export to ECOWAS (excluding Liberia) was

US\$3,872.22 million. Total intra-ECOWAS trade was US\$7,792.70 million in 2009 as compared to US\$6,979.15 million in 2008.

The ratio of intra-regional trade to GDP is an indicator of trade openness in the WAMZ. This is found by the ratio of the total trade of a member country with the regional grouping over the GDP of the member country. Under the reviewed period (2001-2011), Ghana's average trade openness in the WAMZ was 2.5%; Gambia's was 0.77%; Guinea (2001-2008) 0.32% and Nigeria 0.107%, implying that Ghana was more opened to intra-WAMZ trade.

On the degree of regional trade integration of the WAMZ's member countries, which was attained by the ratio of intra-regional trade to the total trade, Ghana was found to be more integrated in the WAMZ, followed by Nigeria, Gambia and Guinea. However, the intensity of trade across the WAMZ is very minimal to generate any benefit from the use of a common currency. The average trade intensity in the European Monetary Union was more than 40% before its commencement, WAMZ on the other hand has average trade intensity of less than 3%. This means that the WAMZ is far behind.

Also, all the WAMZ member countries are likely to experience asymmetric shocks due to their dependence on mono or duo-export product. For example, Ghana largely relies on export of cocoa and gold while Nigeria depends on oil export which accounts for about 95% of its export earnings. Also, while The Gambia relies on tourism and peanut, the Sierra Leone and Guinea depend on diamond and bauxite respectively. This difference in export is likely to slow down convergence among member countries of the WAMZ.

5.3.6 Political Will and Public Support

Apart from the macroeconomics convergence criteria set to be achieved by the WAMZ member countries, the Banjul Action Plan set other programmes to be implemented by member countries. The implementations of these programmes were meant to promote common market and financial integration in the WAMZ. Most of these programmes were supposed to be implemented by 2008.

A report by West African Institute 2008, indicates that none of the countries was able to implement fully the programmes set in the Banjul Action Plan. However, some progress has been made so far by each of the WAMZ member countries. It can therefore be said that, there is an element of political will among the WAMZ member countries but not so high to speedy up the monetary union process.

Also the programme to educate the general public on the creation of monetary has been so adamant. Most of the common people in each country of the WAMZ might not even be aware about the creation of a single currency in the zone.

5.4 Optimum Currency Area Index

5.4.1 Results of Stationarity Test

We began by testing the Stationarity of all the variables of our time series data. The Augmented Dickey Fuller test was carried out for the Stationarity test using the E-view 7. The tables below show the Augment Dickey-Fuller unit root test for the various variables.

Table 5.13: Augmented Dickey-Fuller Unit Root Test

Country	Variable	t-statistic	p-value
Gambia-US			
	L	-4.105	0.0034***
	INFL	0.130	0.9627
	DINFL	-3.130	0.0353**
	DISSIM	-1.681	0.4303
	DDISSIM	-2.231	0.2000
	DDDISSIM	-4.465	0.0014***
	SIZE	-4.400	0.0017***
	TRADE	-12.900	0.0000***
	OPENNESS	-1.281	0.6251
	DOPENNESS	-5.934	0.0000***
Ghana-US			
	L	1.005	0.9955
	DL	-7.353	0.0000***
	INFL	-0.561	0.8644
	DINFL	1.898	0.0097***
	DISSIM	-1.540	0.4994
	DDISSIM	-5.442	0.0001***
	SIZE	1.395	0.9985
	DSIZE	-11.349	0.0000***

	TRADE	-13.617	0.0000***
	OPENNESS	-11.937	0.0000***
Nigeria-US			
	L	-2.515	0.1223
	DL	-3.943	0.0053***
	INFL	1.385	0.9980
	DINFL	-4.136	0.0033***
	DISSIM	-1.820	0.3636
	DDISSIM	-1.558	0.4908
	DDDISSIM	-4.638	0.0009***
	SIZE	1.745	0.9995
	DSIZE	-4.485	0.0013***
	TRADE	-7.826	0.0000***
	OPENNESS	-10.985	0.0000***
Gambia-Ghana			
	L	-1.924	0.316
	DL	-3.483	0.0159**
	INFL	-3.363	0.0109**
	SIZE	0.4188	0.9806
	DSIZE	-4.1968	0.0027***
	DISSIM	-2.562	0.1059

	DDISSIM	-7.747	0.0000***
	TRADE	-2.688	0.0881**
	DTRADE	-9.789	0.0000***
Nigeria-Ghana			
	L	-2.035	0.2709
	DL	-4.303	0.0021***
	INFL	-3.270	0.0255**
	SIZE	2.033	0.9998
	DSIZE	-3.576	0.0125**
	DISSIM	3.513	1.0000
	DDISSIM	-7.500	0.0000***
	TRADE	-1.193	0.6646
	DTRADE	-6.746	0.0000***

, **, * above the test statistics indicate the statistical significance of the test statistics at 10%, 5% and 1% respectively.*

Few of the variables were stationary at 5% significant levels in their levels but most of them were not. As a result the variables that were not stationary were differenced once and the result showed that most of the variables were stationary in their first differencing. Again the few remaining variables that were not stationary in their first differencing were differenced again to make them stationary.

Stationarity was required to avoid spurious regression. The rejection of the null hypothesis for the ADF test is based on the McKinnon critical values. The lag length of the ADF test was selected based on the AIC.

5.4.2 Regression analysis

The purpose of this regression is to determine the relationships between the dependent variable and the explanatory variables. The robust regression model in the Stata 12 is used.

Using US as a peg country for WAMZ OCA index

Table 5.14: Gambia-US robust regression

```
Robust regression                                Number of obs =      30
                                                F(  5,    24) =   13.77
                                                Prob > F       =   0.0000
```

l	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
difnl	2.965734	1.503445	1.97	0.060	-.1372241	6.068691
dddissim	1.109296	.4596182	2.41	0.024	.1606907	2.057901
size	33.45242	6.36909	5.25	0.000	20.30726	46.59757
trade	4362110	2043695	2.13	0.043	144131.6	8580089
dopenness	-1197.656	638.1523	-1.88	0.073	-2514.737	119.4259
_cons	-720.2995	137.4881	-5.24	0.000	-1004.061	-436.5379

Table 5.15: Ghana-US Robust regression

Robust regression

Number of obs = 30

F(5, 24) = 10.97

Prob > F = 0.0000

dl	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
dinfl	4.328126	.9469938	4.57	0.000	2.373627	6.282625
dsize	-860.0646	153.3961	-5.61	0.000	-1176.659	-543.4706
ddissim	-.9783873	.5554675	-1.76	0.091	-2.124816	.1680413
trade	-28592.95	9486.956	-3.01	0.006	-48173.07	-9012.837
openness	250.6177	70.23252	3.57	0.002	105.6649	395.5705
_cons	8.478844	7.947154	1.07	0.297	-7.923275	24.88096

Table 5.16: Nigeria-US Robust regression

Robust regression

Number of obs = 30

F(5, 24) = 8.70

Prob > F = 0.0001

dl	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
dinfl	4.027666	1.002265	4.02	0.001	1.959093	6.096239
dddissim	-.6253703	.6290897	-0.99	0.330	-1.923748	.673007
dsize	-913.5654	172.287	-5.30	0.000	-1269.148	-557.9824
trade	-30471.64	11128.3	-2.74	0.011	-53439.33	-7503.954
openness	279.0253	77.04374	3.62	0.001	120.0149	438.0358
_cons	7.327197	9.472078	0.77	0.447	-12.22221	26.87661

Inflation differential: The results show that this variable has a positive and statistically significant effect on exchange rate volatility for all the countries at least at 10%

significance level. The expected sign of inflation differential is theoretically indeterminate.

Dissimilarity of merchandise trade commodity structure: The results show that this variable has a mixed effect on exchange rate volatility. The estimated parameter on this variable is statistically significant, positively at 5% significance level for The Gambia and negatively at 1% significance level for Ghana on exchange rate volatility. However for the case of Nigeria though negative, the variable is statistically insignificant even at 10%. The expected sign for this variable is supposed to be negative (Horvath 2003).

Economic size: Of greater interest to this study is the role of the size of an economy on exchange rate volatility. The results suggest that this variable has a negative and statistically significant effect on exchange volatility for Nigeria and Ghana. However, this variable is positive and statistically significant for The Gambia.

Trade intensity: This variable is expected to have a negative effect on exchange volatility (Horvath 2003). This result is in line with the theory for the variable for Ghana and Nigeria at 5% significance levels. However, for The Gambia it is positive and significant at 5% significant level.

Openness of trade: This variable is also important to the exchange rate volatility. The openness parameter estimate is statistically significant for Ghana and Nigeria and it is positive but it is negative for The Gambia at the 10% significance level. The effect of openness of trade on exchange rate is also indeterminate theoretically.

Using Ghana as a peg country for the WAMZ OCA index

Table 5.17: Gambia-Ghana Robust regression

Robust regression

Number of obs = 30

F(4, 25) = 15.50

Prob > F = 0.0000

dl	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
dtrade	-89.19314	36.92223	-2.42	0.023	-165.2359	-13.15038
dsize	-1.722293	.6774917	-2.54	0.018	-3.117613	-.3269728
infl	.009855	.0014665	6.72	0.000	.0068347	.0128752
ddissim	-.0023958	.007752	-0.31	0.760	-.0183614	.0135698
_cons	.1661227	.0386511	4.30	0.000	.0865193	.2457262

Table 5.18: Nigeria-Ghana Robust regression

Robust regression

Number of obs = 29

F(4, 24) = 351.86

Prob > F = 0.0000

dl	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
infl	-.0004854	.000228	-2.13	0.044	-.000956	-.0000149
dsize	-.0059765	.002905	-2.06	0.051	-.011972	.0000191
dtrade	3.867648	.1215079	31.83	0.000	3.616868	4.118428
dissim	-.000034	.0000294	-1.16	0.258	-.0000946	.0000265
_cons	.2976903	.0019556	152.23	0.000	.2936542	.3017264

Inflation differential: The result indicates that this variable has a positive and negative significant effect on exchange rate volatility for The Gambia and Nigeria respectively.

Dissimilarity of merchandise trade commodity structure: The parameter estimate for this variable is negative and statistically significant on exchange rate volatility for the two countries.

Economic size: This variable is important to the volatility of exchange rate. The parameter estimate for this variable is negative and statistically significant at 1% for both countries. However, the effect of trade intensity on exchange rate volatility is insignificant for both countries.

Trade Intensity: However, the effect of trade intensity on exchange rate volatility is insignificant for both countries.

5.4.3 Diagnostic tests

As said earlier, the robust regression is an advanced form of the ordinary least square method. The method caters for the likelihood of outliers, heteroscedasticity and other problems encountered when using the OLS regression model. The F-statistic test as a diagnostic tool was relied upon during the analysis.

Table 5.19: F-Statistic test

Country	Prob >F
The Gambia-US	0.0000
Ghana-US	0.0000
Nigeria-US	0.0001
The Gambia-Ghana	0.0000
Nigeria –Gambia	0.0000

The F-tests above indicate that the model has the desired econometric properties. It also indicates that the explanatory variables account for the variation in the exchange rate volatility. That is, the indicator variables of the exchange rate volatility are jointly significant.

5.4.4 The OCA index results

Using US dollar as a peg currency

Table 5.20 presents the OCA index on average (1980-2011) for three countries of the WAMZ. In this study US is considered as the pegging country and therefore all the exchange rates are against US Dollar. The results show that the Nigerian Naira is the most stable currency with the lowest OCA index followed by the Ghanaian Cedi and The Gambian Dalasi. The results also indicate that Nigeria will benefit most externally from

the formation of the monetary union. However, the difference in the indices among the WAMZ member countries indicates that the WAMZ is not near an optimum currency area.

Table 5.20: Average OCA indices of WAMZs currencies (against US dollar)

Countries	OCA index
The Gambia-US	3.576
Ghana-US	1.616
Nigeria-US	0.670

If the WAMZ wants to establish a single currency as a now, then the process should be started with integrated Ghana Cedis and Nigerian Naira and then followed by the Gambian Dalasi. This result is similar to the study done by Achsani (2010) for the ASEAN+3 countries. However from his computation, the OCA indices of the ASEAN+3 currencies (against US Dollar) are positive and less than 1. This result could mean that the ASEAN+3 countries are more integrated than the WAMZ.

Using the Ghanaian Cedi as a peg Currency

Since Ghana is more opened to intra-WAMZ trade, we also use Ghana as a peg country among the WAMZ's countries. That is, all exchange rates are pegged against the Ghanaian Cedi.

The result shows the Nigerian Naira is more stable than the Gambian Dalasi

Table 5.21: Average OCA indices of WAMZ's currencies (against Ghana Cedi)

Countries	OCA index
The Gambia-Ghana	0.329
Nigeria-Ghana	0.198

The results above indicate that Nigeria is likely to benefit the most from the formation of monetary union by the WAMZ, followed by The Gambia. The results show that if WAMZ will establish a single currency with Ghana as a constant, then the process should be started with integrated Nigerian Naira and then Ghanaian Cedi then followed by Gambian Dalasi.

5.5 Conclusion

In order for countries to benefit from the formation of monetary union, those countries need to attain some preconditions to make such benefit possible. The Optimum Currency Area theory has proposed various conditions necessary for the formation of a monetary union. One of these preconditions is the convergence of some macroeconomic indicators among the participating countries.

The WAMI, an institution tasked to see to the creation of a single currency in the WAMZ has set Macroeconomics Convergence Criteria targets for the participating countries.

Ghana is the only country to have met all the primary convergence criteria in 2011. However, evidence shows that Nigeria and The Gambia have performed well on the primary convergence criteria under the review period. The results also indicate that most of these primary convergence criteria are converging gradually. However, evidence on the achievement of the secondary Macroeconomic Convergence Criteria shows a poor performance for all the participating countries under the review period. There are also no sign of convergence of the secondary Macroeconomics Convergence Criteria. In summary, the analysis below shows that the WAMZ participating countries were not ready for the formation of the monetary union as of 2011. Also there is no sign of readiness in the short or the medium term since most of the economic indicators are either converging slowly (the primary Macroeconomic Convergence Criteria) or even diverging (the secondary Macroeconomics Convergence Criteria). However, convergence is feasible in the long run.

Also the test on some of the conditions for assessing an Optimum Currency Area indicates mixed results with most of them being unfavourable for the formation of a monetary union by the WAMZ. The co-movement of the economic activity (business cycle synchronization) in the region is favourable for the use of a single currency in the WAMZ. However, the level and the sectorial composition of output of the WAMZ participating countries indicate that the zone is likely to experience asymmetric shocks. These unfavourable conditions are likely to make the creation of the common currency unbeneficial for the WAMZ participating countries.

The average GDP per capita under the review period separates the WAMZ member countries into two groups, in terms of economic size or standard of living namely Nigeria

and Ghana on the one hand and The Gambia, Guinea, Sierra Leone, and Liberia on the other hand. The difference in the GDP per capita among these two groups is more than 50%. While Ghana and Nigeria are considered as middle income economies, the other four WAMZ's participating countries fall under the low income economy. The level of economic income in the WAMZ is not uniform.

Most of the WAMZ's participating countries are dominated by either the agricultural or the services sector, except Nigeria which is dominated by the industrial sector. The OCA theory proposes that countries with similar sectorial composition of output are favourable for the formation of a monetary union since they are likely to experience a symmetric shock. However, this situation might be different for the WAMZ. The compositions of their exports indicate that most of the WAMZ member countries depend on different mono or duo export products. This means that with the formation of a monetary union, the WAMZ is likely to experience asymmetric shocks from international or external trade. Also since most of these WAMZ's participating countries are dominated by the agricultural sector intra-regional trade is likely to be low in the region as seen in their degree of openness to intra-regional trade. The member countries of the WAMZ are very open to external trade as their average ratio of export to the GDP is more than 50%. However, the level of internal trade is very low for the participating countries to benefit from the use of a single currency. None of the WAMZ member countries exports more than 10% of their products to any of its members as compared to the Euro-zone which was more than 40% before its commencement. Also, the low level of labour mobility and the low diversification of industry product make the formation of the monetary union by the WAMZ unfavourable.

The degree of political will and public support in terms of the implementation of the BAP and the creation of public awareness is not strong enough to speed the formation of the monetary union. Most of the WAMZ participating countries are slow or reluctant to implement policies to enhance the macroeconomics convergence or the financial market integration. In summary, the WAMZ is not an Optimum Currency Area and are far behind from reaching the level attained by the euro-zone before they formed the monetary union. The zone is unfavourable to most of the conditions proposed by the OCA theorists.

However, in all the analysis on the OCA, Nigeria and Ghana have shown some level of closeness as compared to the other WAMZ participating countries. This evidence is confirmed by the computation of the WAMZ OCA index. The results indicate Nigeria is likely to benefit the most from the formation of a monetary zone union from the region, followed by Ghana.

The OCA index results also indicates that if the WAMZ still want to form the monetary under all the unfavourable conditions as discussed above, then the zone should start with Nigeria and Ghana followed by The Gambia.

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.0 Introduction

This chapter summarizes the whole study, draws out conclusions from the research questions and provides policy recommendations for the study. The chapter is organized in the following manner. Section 6.1 provides the summary and conclusion from the study. Section 6.2 provides policy recommendation based on the summary and the conclusion. Finally, section 6.3 draws out the limitations of the study.

6.1 Summary and Conclusion

The purpose of this study has been to assess the readiness of the West African Monetary Zone to form a Monetary Union. Specifically, the study sought to identify the preparedness for the formation of a Monetary Union as of 2011 using the Macroeconomics Convergence Criteria. The study also sought to assess the Optimum Currency Area of the WAMZ as well as compute an OCA index to identify which countries can start the formation of the Monetary Union and which countries are likely to benefit the most.

The relevant theoretical literature reviewed on this study shows that in order for the participating countries to benefit from a Monetary Union, the region should be an Optimum Currency Area. Various traditional OCA theorists have proposed some

conditions that should be considered by countries willing to form a monetary union. These pre-conditional factors are needed to enhance or promote a beneficial monetary union to the participating countries. The convergence of macroeconomic indicators is one of the pre-conditional ways for countries which want to use a common currency. In addition, there are other traditional Optimum Currency Criteria meant to reduce the cost of losing the use of monetary policy or exchange rate as an adjustment tool by the participating countries.

The WAMZ with its objective of creating a Monetary Union has adopted the Macroeconomic Convergence Criteria as a pre-conditional factor to be attained by member countries. The analysis indicates that under the reference period, the member countries of the WAMZ are not ready to form the Monetary Union on the basis of the Macroeconomics Convergence Criteria. None of the WAMZ's member countries under the review has consistently met all the set targets for the primary and the secondary convergence criteria. There are however some indications in the convergence of the primary Macroeconomics Convergence Criteria of the WAMZ's participating countries but the case is opposite for the secondary Macroeconomics Convergence Criteria.

Also, the WAMZ failed to meet most of the criteria proposed by the traditional Optimum Currency Area theorists. Some of these criteria included the mobility of labour, degree of product diversification, political will, and among others. This means that WAMZ cannot be considered as an Optimum Currency Area. This also indicates that the formation of a Monetary Union by the WAMZ at this stage of preparation will not be beneficial.

Rose and Frankel (1998) have indicated that even if the region is not an Optimum Currency Area, the common currency will intensify trade among the participating countries. In other words, a region must not necessarily be an Optimum Currency Area before adopting a single currency. The adoption of common currency will cause the participating countries to converge through trade intensity. Applicably, the WAMZ does not have to be an Optimum Currency Area before adopting the common currency. If the WAMZ wants to adopt the single currency before becoming an Optimum Currency Area, the results from the OCA index indicate that the zone can start the integration with Ghana and Nigeria followed by The Gambia. Also, the result indicates that Nigeria is likely to benefit the most, followed by Ghana.

6.2 Policy Recommendations

The proposed WAMZ monetary union has suffered several postponements; therefore another postponement after 2016 might cause great damage and loss of interest by the participating countries. The decision by the WAMZ authorities to establish a monetary union is unchangeable. However, the union must start on a strong foundation to enhance sustainability and maximum gain from the use of a common currency in the zone.

From the study, it can be seen that the participating countries of the WAMZ are not doing enough to meet the set macroeconomics convergence criteria targets. The WAMI is not mandated to force the participating countries in meeting the set targets. Under this condition, the study recommends the WAMI to put in place some incentive measures which can encourage the participating countries to achieve the MCC set targets.

From the study, the degree of intra-regional trade in the zone is very low. The study recommends that each of the participating countries of the WAMZ remove all its trade barriers in the zone. Also, the study recommends the participating countries to specialize in the industry sector (where they have comparative cost advantage) with respect to manufacturing, mining and construction. This specialization in production can enhance product diversity and hence intensify trade in the zone. Once the degree of product diversity increases and intra-regional trade intensifies, other factors such as capital and labour mobility, co-movement of economic activities, internal trade openness, etc. in the zone will be positively affected. However, in order to promote the mobility of labour in the zone, the study recommends that each of the WAMZ participating country intensifies its national security level.

From the study, it will be difficult for all the participating countries to converge before the formation of the WAMZ monetary union. Based on empirical evidence, the study recommends the WAMZ monetary union to commence if at least two participating countries satisfy the macroeconomic convergence criteria consecutively for at least three years and have implemented most of the BAP programmes. The European Union adopted this model; they started with some countries and others joined later as to when they met the criteria.

Also, based on theoretical and empirical evidence, the study recommends the zone to assume that convergence can be achieved *ex post* if the WAMZ's institutional measures are functioning properly, therefore ignoring the precondition (*ex-ante*). The WAEMU arguably adopted this model as the member countries did not converge before adopting their common currency. However, the case of the WAEMU is slightly different since

their currency is controlled by the European Union. The WAMZ can also adopt the Dollar or British Pound initially and then adopt the ECO when most of the countries converge.

If the WAMZ wants to take any of the recommendations proposed above, then the participating countries should forget about benefiting from the monetary union in the short or the medium term. However, a long term benefit can be possible but not guaranteed. This is because if forceful institutional measures cause the participating countries to converge, some might attain unfavourable economic environment which can retard economic growth and development in the zone.

The last but perhaps the most important recommendation is to allow the participating countries to converge without any external force and also allow the zone to near an Optimum Currency Area. There is more room for improvement if the WAMZ really want to benefit from the monetary union. The WAMZ should not rush to commence the monetary union when relevant factors are not put in place. The European Zone in their formation of a monetary union took about 50 years for the preparation, yet it is continuously suffering from economic crisis. If the EMU is experiencing crisis in spite of its intensive preparedness before commencement, then WAMZ must be cautious. The zone must learn from the mistakes of the EMU, put in place effective measures so as not to repeat same.

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APPENDIX 1

GRAPHES SHOWING THE MCC FOR THE WAMZ

Figure 5.0 Inflation Rate of the WAMZ (2001-2011)

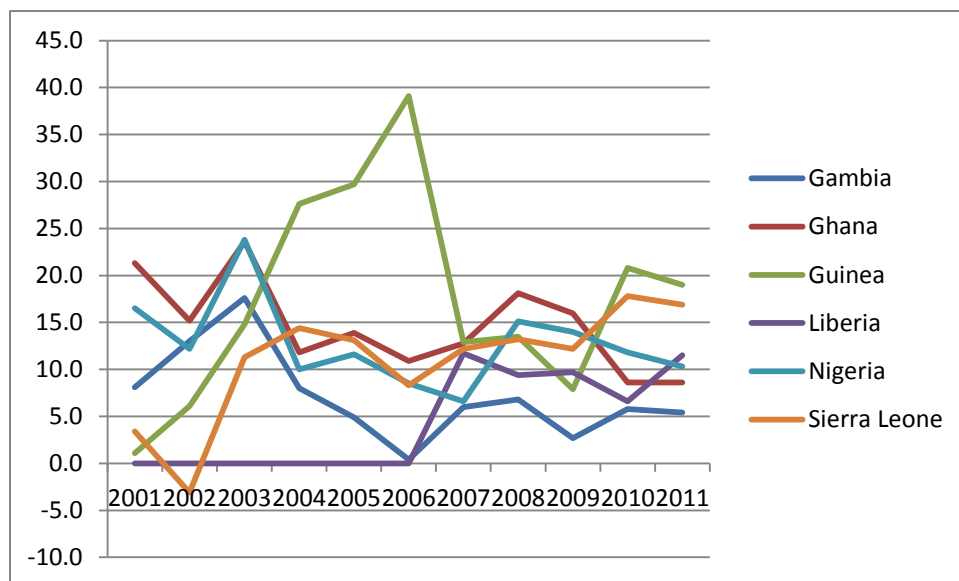
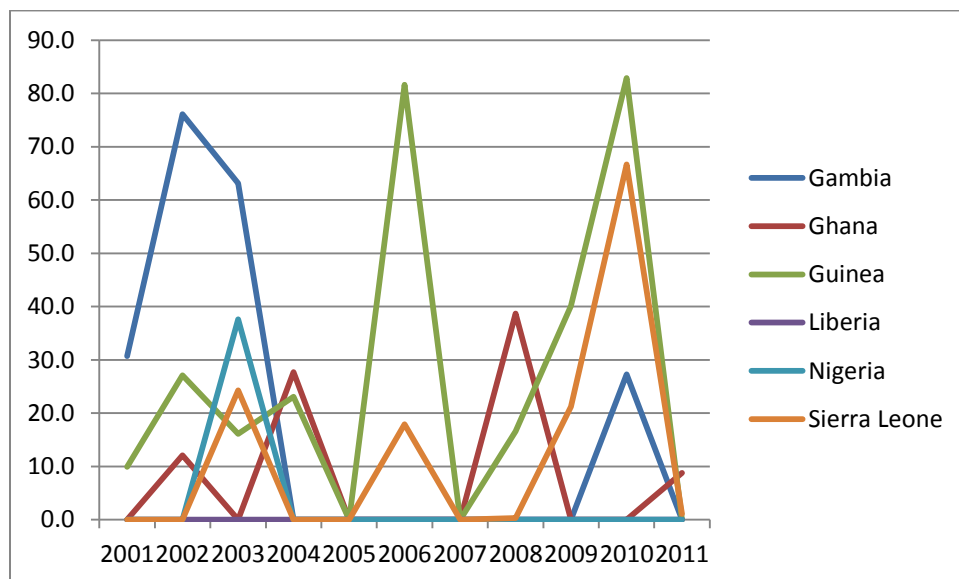


Figure 5.1: Central Bank Financing of Fiscal Deficit for the WAMZ (2001-2011)



GRAPH SHOWING THE MCC FOR THE WAMZ (CONT'D)

Figure 5.3: Fiscal Balance/GDP for the WAMZ (2001-2011)

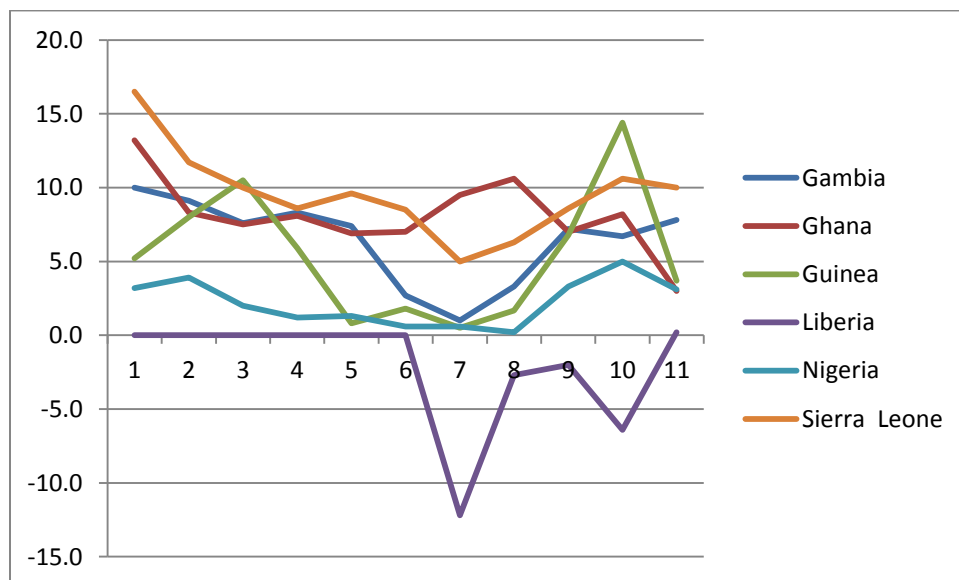
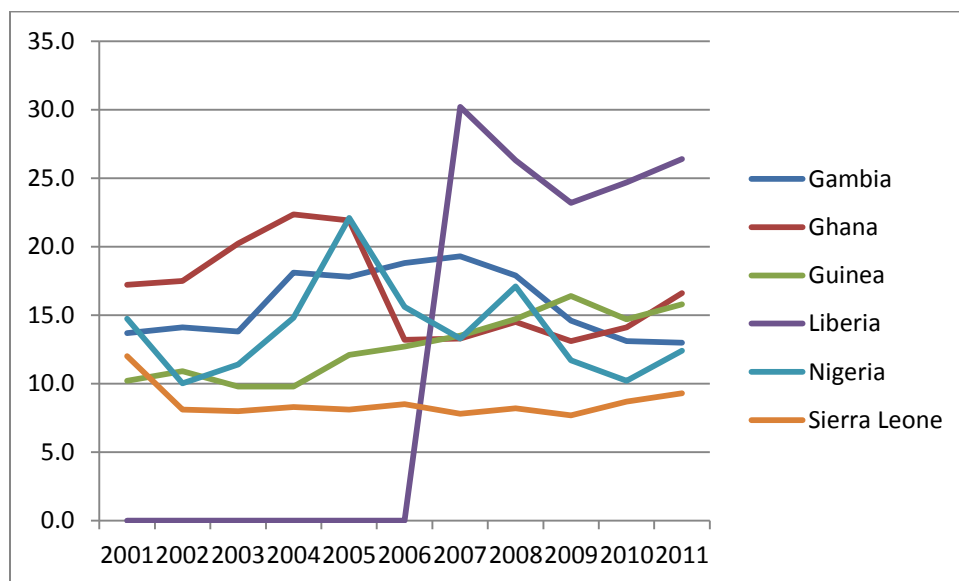


Figure 5.5: Ratio Tax/GDP for the WAMZ (2001-2011)



GRAPH SHOWING THE MCC FOR THE WAMZ (CONT'D)

Figure 5.4 Gross External Reserves for the WAMZ (2001-2011)

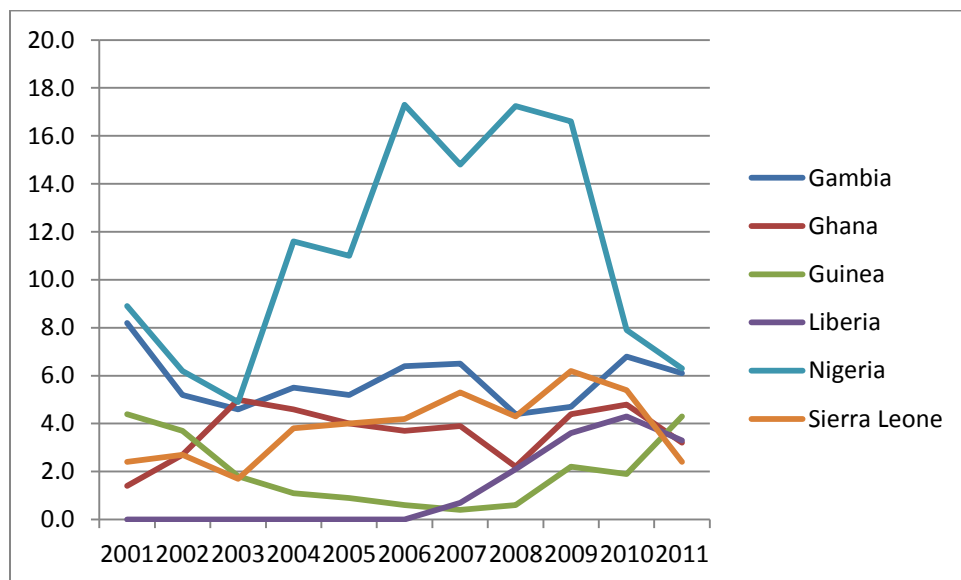
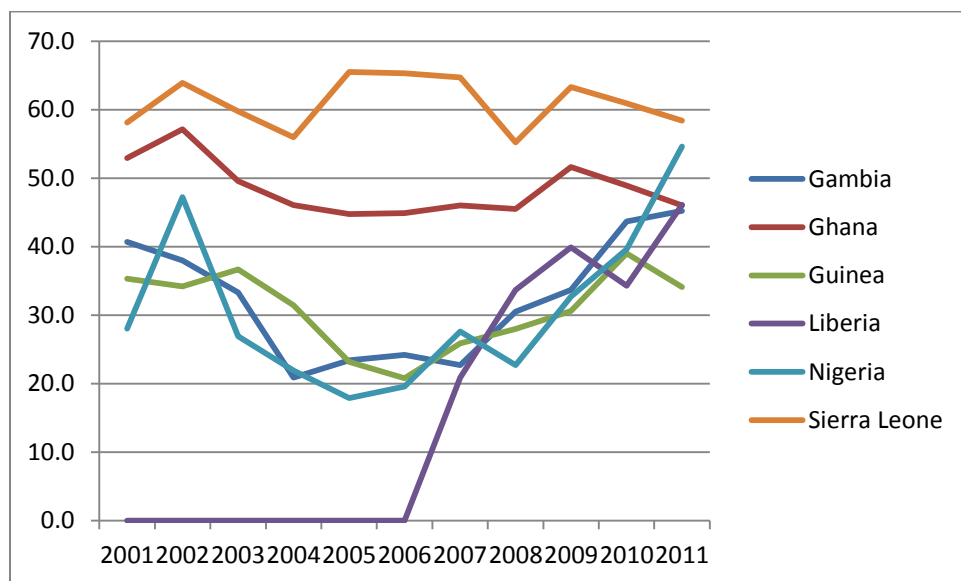
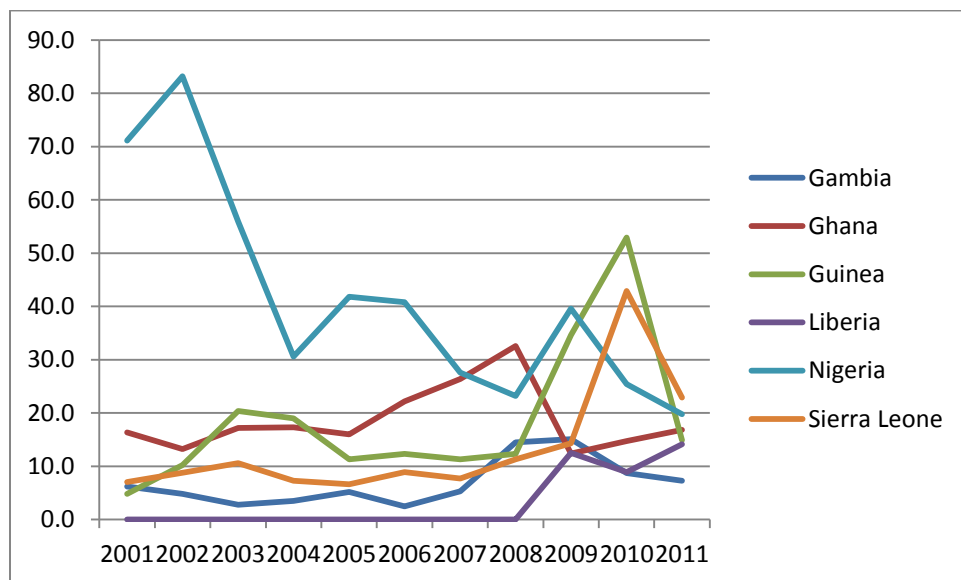


Figure 5.6: Wage/Tax Revenue for the WAMZ (2001-2011)

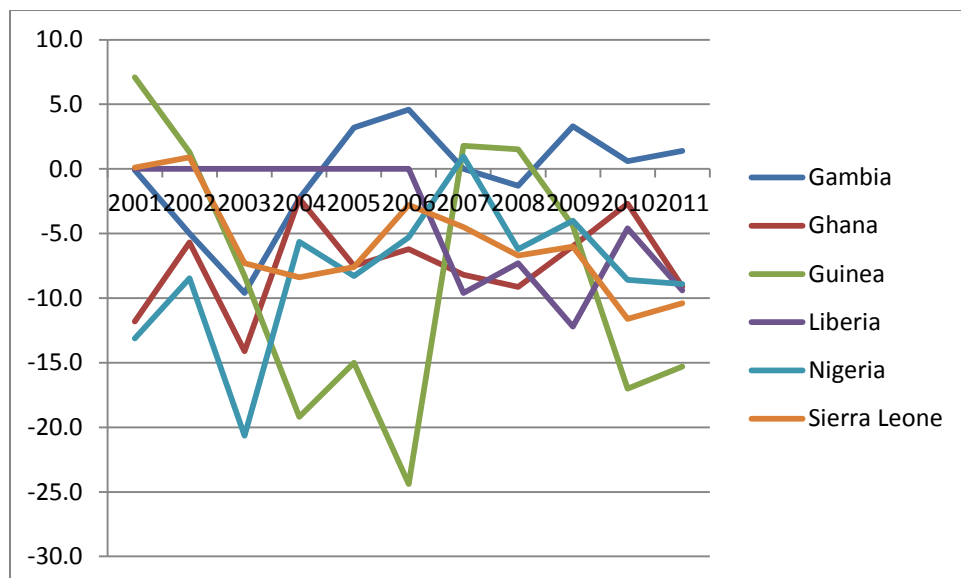


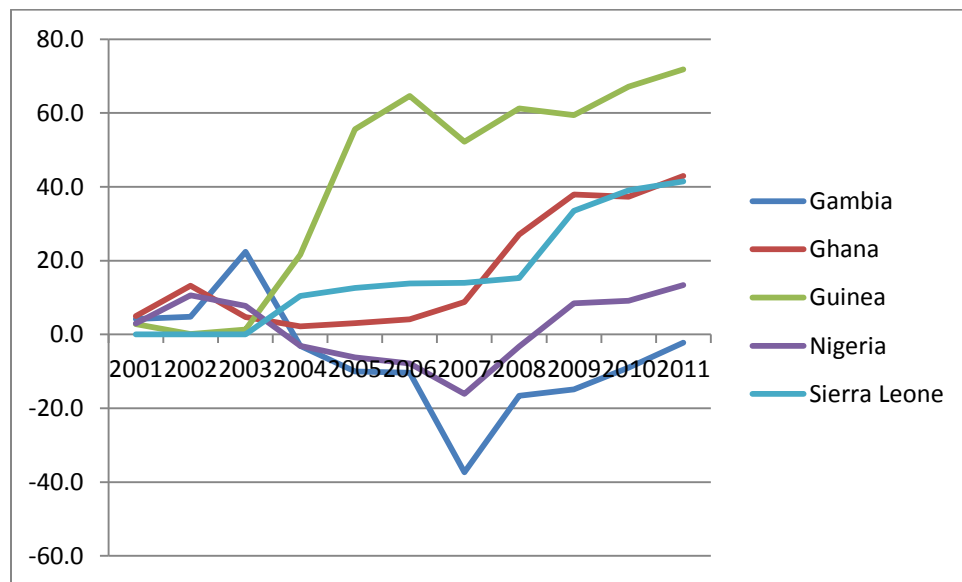
GRAPH SHOWING THE MCC FOR THE WAMZ (CONT'D)

Graph 5.7: Public Investment/Domestic revenue for the WAMZ (2001-2011)



Graph 5.8: Real Interest Rate for WAMZ (2001-2011)



GRAPH SHOWING THE MCC FOR THE WAMZ (CONT'D)**Graph 9: Depreciation for the WAMZ (2001-2011)**

APPENDIX 2

STUDY DATA SET USED FOR MMC ANALYSIS

Annex 1a: Status of compliance with the Primary convergence criteria											
Primary Criteria	Inflation Rate (end of period)										
Target	<10%										
	2001 Dec	2002 Dec	2003 Dec	2004 Dec	2005 Dec	2006 Dec	2007 Dec	2008 Dec	2009 Dec	2010 Dec	2011 Dec
Gambia	8.1	13.0	17.6	8.0	4.9	0.4	6.0	6.8	2.7	5.8	5.4
Ghana	21.3	15.2	23.6	11.8	13.9	10.9	12.8	18.1	16.0	8.6	8.6
Guinea	1.1	6.1	14.8	27.6	29.7	39.1	12.9	13.5	7.9	20.8	19.0
Liberia	n.a	n.a	n.a	n.a	n.a	n.a	11.7	9.4	9.7	6.6	11.5
Nigeria	16.5	12.2	23.8	10.0	11.6	8.5	6.6	15.1	14.0	11.8	10.3
Sierra Leone	3.4	-3.1	11.3	14.4	13.1	8.3	12.2	13.2	12.2	17.8	16.9
WAMZ	15.2	11.6	22.1	11.5	13.4	11.5	8.2	15.2	13.5	12.4	11.2
Nber of Countries	3	2	0	1	1	3	2	2	3	3	2
Primary Criteria	Central Bank financing of fiscal deficit										
Target	≤ 10%										
	2001 Dec	2002 Dec	2003 Dec	2004 Dec	2005 Dec	2006 Dec	2007 Dec	2008 Dec	2009 Dec	2010 Dec	2011 Dec
Gambia	30.7	76.1	63.1	0.0	0.0	0.0	0.0	0.0	0.0	27.3	0.0
Ghana	0.0	12.1	0.0	27.7	0.0	0.0	0.0	38.7	0.0	0.0	8.8
Guinea	9.9	27.1	16.1	23.1	0.0	81.6	0.0	16.6	40.1	82.9	0.0
Liberia	n.a	n.a	n.a	n.a	n.a	n.a	0.0	0.0	0.0	0.0	0.0
Nigeria	0.0	0.0	37.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sierra Leone	0.0	0.0	24.3	0.0	0.0	17.9	0.0	0.3	21.2	66.7	1.1
WAMZ	0	0	38	0	0	0	0	4	1	35	1
Nber of Countries	4	2	1	3	5	4	6	4	4	2	6

WAMI

STUDY DATA SET USED FOR MMC ANALYSIS (CONT'D)

	Target			< 4 %*							
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
	Dec	Dec	Dec	Dec	Dec	Dec	Dec	Dec	Dec	Dec	Dec
Gambia	10.0	9.1	7.6	8.3	7.4	2.7	1.0	3.3	7.2	6.7	7.8
Ghana	13.2	8.3	7.5	8.1	6.9	7.0	9.5	10.6	7.0	8.2	3.0
Guinea	5.2	8.0	10.5	5.9	0.8	1.8	0.5	1.7	6.8	14.4	3.7
Liberia	n.a	n.a	n.a	n.a	n.a	n.a	-12.2	-2.7	-2.0	-6.4	0.2
Nigeria	3.2	3.9	2.0	1.2	1.3	0.6	0.6	0.2	3.3	5.0	3.1
Sierra Leone	16.5	11.7	10.0	8.6	9.6	8.5	5.0	6.3	8.6	10.6	10.0
WAMZ	4.2	4.5	2.9	2.0	1.7	1.3	1.3	1.4	3.8	6.3	2.7
Nber of Countries	1	1	1	1	2	3	4	3	1	0	4
Primary Criteria											
Target	Target				≥ 3						
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
	Dec	Dec	Dec	Dec	Dec	Dec	Dec	Dec	Dec	Dec	Dec
Gambia	8.2	5.2	4.6	5.5	5.2	6.4	6.5	4.4	4.7	6.8	6.1
Ghana	1.4	2.7	5.0	4.6	4.0	3.7	3.9	2.2	4.4	4.8	3.2
Guinea	4.4	3.7	1.8	1.1	0.9	0.6	0.4	0.6	2.2	1.9	4.3
Liberia	n.a	n.a	n.a	n.a	n.a	n.a	0.7	2.1	3.6	4.3	3.3
Nigeria	8.9	6.2	4.9	11.6	11.0	17.3	14.8	17.2	16.6	7.9	6.3
Sierra Leone	2.4	2.7	1.7	3.8	4.0	4.2	5.3	4.3	6.2	5.4	2.4
WAMZ	7.3	5.3	4.7	9.6	10.0	12.1	11.4	11.1	13.9	7.0	5.7
Nber of Countries	3	3	3	4	4	4	4	3	5	5	5

WAMI

STUDY DATA SET USED FOR MMC ANALYSIS (CONT'D)

Status of compliance with the Secondary Convergence Criteria												
Ratio Tax/GDP > 20%	Countries	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
	Gambia	13.7	14.1	13.8	18.1	17.8	18.8	19.3	17.9	14.6	13.1	13.0
	Ghana	17.2	17.5	20.2	22.4	21.9	13.2	13.3	14.5	13.1	14.1	16.6
	Guinea	10.2	10.9	9.8	9.8	12.1	12.7	13.5	14.7	16.4	14.7	15.8
	Liberia	n.a	n.a	n.a	n.a	n.a	n.a	30.2	26.3	23.2	24.7	26.4
	Nigeria	14.7	10.0	11.4	14.8	22.1	15.6	13.3	17.1	11.7	10.2	12.4
	Sierra Leone	12.0	8.1	8.0	8.3	8.1	8.5	7.8	8.2	7.7	8.7	9.3
	WAMZ	14.6	10.7	12.0	15.2	19.6	15.3	11.2	16.9	12.0	12.3	13.1
Wages/Tax Revenue ≤ 35%	Countries	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
	Gambia	40.7	38.0	33.3	20.9	23.4	24.2	22.7	30.5	33.7	43.7	45.2
	Ghana	52.9	57.2	49.6	46.1	44.8	44.9	46.0	45.5	51.6	48.9	46.0
	Guinea	35.3	34.2	36.7	31.5	23.2	20.8	25.9	28.0	30.6	39.0	34.1
	Liberia	n.a	n.a	n.a	n.a	n.a	n.a	20.9	33.7	39.9	34.3	46.1
	Nigeria	28.0	47.2	26.9	21.9	17.9	19.6	27.6	22.7	32.7	39.6	54.6
	Sierra Leone	58.1	63.9	59.7	56.0	65.5	65.3	64.7	55.2	63.3	60.9	58.4
	WAMZ	30.8	48.2	30.8	25.6	21.1	22.7	34.7	25.3	35.6	41.2	37.8
Pub Invest/ Dom.Rev > 20%	Countries	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
	Gambia	6.2	4.8	2.8	3.5	5.2	2.5	5.3	14.5	15.1	8.7	7.3
	Ghana	16.4	13.2	17.2	17.3	16.0	22.2	26.4	32.6	12.4	14.7	16.8
	Guinea	4.8	10.2	20.4	19.0	11.3	12.3	11.3	12.3	34.6	52.9	14.9
	Liberia	n.a	n.a	n.a	n.a	n.a	n.a	na	na	12.5	8.9	14.1
	Nigeria	71.1	83.2	55.9	30.6	41.8	40.8	27.6	23.2	39.6	25.4	19.8
	Sierra Leone	7.0	8.8	10.6	7.3	6.6	8.9	7.7	11.3	14.3	42.9	22.9
	WAMZ	31.0	34.9	23.8	13.5	18.4	59.7	14.5	13.4	22.6	13.6	11.9
Real Interest >0	Countries	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
	Gambia	-0.1	-5.0	-9.6	-2.3	3.2	4.6	0.0	-1.3	3.3	0.6	1.4
	Ghana	-11.8	-5.7	-14.1	-2.3	-7.5	-6.2	-8.2	-9.1	-6.0	-2.7	-9.1
	Guinea	7.1	1.3	-8.3	-19.2	-15.0	-24.4	1.8	1.5	-4.4	-17.0	-15.3
	Liberia	n.a	n.a	n.a	n.a	n.a	n.a	-9.6	-7.3	-12.2	-4.6	-9.4
	Nigeria	-13.1	-8.5	-20.6	-5.6	-8.3	-5.3	1.0	-6.2	-4.0	-8.6	-8.9
	Sierra Leone	0.1	0.9	-7.3	-8.4	-7.6	-2.8	-4.5	-6.7	-6.0	-11.6	-10.4
Depreciation (±15%)	Countries	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
	Gambia	4.2	4.8	22.4	-3.1	-10.0	-10.4	-37.3	-16.6	-14.9	-9.0	-2.2
	Ghana	5.0	13.2	4.7	2.2	3.1	4.1	8.8	27.1	37.9	37.3	42.9
	Guinea	2.8	0.1	1.3	21.6	55.6	64.6	52.2	61.2	59.4	67.1	71.8
	Nigeria	3.0	10.6	7.7	-3.1	-6.2	-7.9	-16.1	-3.3	8.4	9.1	13.4
	Sierra Leone	0.0	0.0	0.0	10.4	12.6	13.8	14.0	15.3	33.5	39.0	41.5
Source: WAMZ Authorities & WAMI Staff												