

**THE WEST AFRICAN MONETARY ZONE: ELIGIBILITY FOR MONETARY
UNIFICATION**

by

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DECLARATION

I, Joseph Kwadwo Asenso, do solemnly declare that, except for references to other people's work, which I have duly acknowledged, this study is a result of my own research initiative and that I have neither presented some nor whole part of it for another degree elsewhere.

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DEDICATION

I dedicate this study to my parents, Mr. Joseph Kwadwo Asenso and Mad. Dora Amoh, as well as my siblings, Ms. Janet Asenso, Mrs. Mary Akwaboah, Dr. Philip Asenso and Kofi Amoh-Mensah, for their moral support, prayers and encouragement without which I would not have come this far.

ABSTRACT

The study seeks to ascertain the feasibility of a plan by the members of the West African Monetary Zone (WAMZ) to form a monetary union. It applies the optimum currency areas (OCA) paradigm to analyse the appropriateness of this major policy prescription by analysing *ex ante* and *ex post* (or endogeneity) eligibility criteria to arrive at its conclusions. The conclusions of the study are arrived at based on shocks correlations, sizes and adjustment speed of shocks, the share of regional shocks in individual countries' business cycles, price trends (to analyze price convergence), the gravity model (to ascertain trade endogeneity) and an analysis of alternative exchange rate arrangements, in lieu of a full monetary union, in the short-to-medium term.

The *ex ante* results indicate that supply shocks have the greatest influence on business cycles and as such, most of the analyses centre around it. It also finds that the countries have asymmetric demand and supply shocks and that traces of symmetric shocks existed in the past rather than the present. Moreover, each of the countries' business cycles are explained more by domestic than by regional shocks while global shocks are gaining momentum, an indication that the maintenance of monetary policy independence might be necessary. Finally, the sizes of demand and supply shocks are found to be larger, individually and averagely, than those of the Euro Area.

For the *ex post* analysis, the study analyzes price, demand and supply shocks and trade endogeneities in the West African Economic and Monetary Union (WAEMU), an existing monetary union in West Africa, and finds that demand shocks synchronicity has been achieved. It also finds that prices in the WAEMU have converged as a result of the pursuit of common monetary policies as opposed to the WAMZ, where prices only began

to show signs of convergence after they had started adhering to some common monetary rules. The study also finds that the establishment of the West African Monetary Institute (WAMI), as a precursor to a regional central bank, has not engendered intra-WAMZ trade. On trade endogeneity, the single currency in the WAEMU is found to have increased intra-regional trade significantly, but the 1994 devaluation of the currency is found to have diverted trade from the WAEMU to other regions.

Thus, the *ex ante* analyses hold that the formation of a monetary union in the WAMZ will not be optimal, based on the fact that the countries do not have common demand and supply shocks with business cycles being caused primarily by domestic rather than regional shocks. However, the *ex post* analyses have shown that it is possible to achieve price convergence, demand shocks synchronicity and trade enhancement endogenously, as evidenced in the WAEMU. One notable absentee is supply shocks (the most important shocks) synchronicity, which the WAEMU has thus far failed to achieve after more than sixty years of existence. Based on the WAEMU's failure to achieve supply shocks and the fact that the WAMZ is geographically disjointed (the study confirms that the border effect is important to trade), the study posits that it may not be advisable to form a monetary union in the WAMZ anytime soon since it may not achieve trade endogeneity unless it gets the WAEMU to activate the single economic space agreement, to which they are both signatories, to facilitate the free movement of goods through the WAEMU into other WAMZ countries.

As an alternative to a full-fledged monetary union, the study suggests the investiture of an exchange rate arrangement which would not necessarily involve the issuance of a new single currency but that would enable the countries to attain

convergence over a period of time before the creation of the monetary union. Based on a series of analyses, the study recommends that the WAMZ should operate an exchange rate mechanism with the euro as the anchor currency, in the intervening period, to help stabilize the macroeconomic environment, since the euro performs better in explaining their business cycles than the dollar. This arrangement, which is expected to take place between five and no more than ten years, is meant to adequately prepare the WAMZ for the eventual objective of creating a monetary union.

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ACRONYMS

ACP	African, Caribbean and Pacific Group of States
AD	Aggregate Demand
ADF	African Development Fund
AEC	African Economic Community
AfDB	African Development Bank
AGOA	African Growth and Opportunities Act
AIC	Akaike Information Criterion
AMU	Arab Maghreb Union
ASEAN	Association of South-East Asian Nations
AU	African Union
BBC	Basket, Band and Crawl Exchange Rate Regimes
BCEAO	<i>Banque Centrale des Etats de l’Afrique de l’Ouest</i>
BEAC	<i>Banque des Etats de l’Afrique Centrale</i>
BOP	Balance of Payments
CAP	Common Agricultural Policy
CEMAC	Central African Economic & Monetary Community (Central African CFA Zone)
CET	Common External Tariff
CFA	<i>Communauté Financière d’Afrique</i> (CFA West Africa)
CFA	<i>Cooperation Financière en Afrique Centrale</i> (CFA Central Africa)
CIA	Central Intelligence Agency
CMA	Common Monetary Area

COMESA	Common Market for Eastern and Southern Africa
CPI	Consumer Price Index
DOT	Direction of Trade Statistics
EAC	East African Community
EACB	East African Currency Board
EC	European Community
ECB	European Central Bank
ECCAS	Economic Community of Central African States
ECCU	Eastern Caribbean Currency Union
ECOBANK	ECOWAS Bank
ECOWAS	Economic Community of West African States
ECU	European Currency Unit
EEC	European Economic Community
EMCP	ECOWAS Monetary Cooperation Programme
EMF	European Monetary Fund
EMI	European Monetary Institute
EMS	European Monetary System
EMU	European Economic and Monetary Union
ERM	Exchange Rate Mechanism
ERP	Economic Recovery Programme
EU	European Union
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment

FFR	French Franc
FTA	Free Trade Area
GCC	Gulf Cooperation Council
GDDS	General Data Dissemination System
GDP	Gross Domestic Product
GSE	Ghana Stock Exchange
HICP	Harmonized Index of Consumer Prices
HIPC	Heavily Indebted Poor Countries
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IFS	International Financial Statistics
IMF	International Monetary Fund
IRFs	Impulse Response Functions
ISI	Import Substitution Industrialization
LCU	Local Currency Unit
LHS	Left Hand Side
LNG	Liquefied Natural Gas
LRAS	Long Run Aggregate Supply
Mercosur	Common Market of the South
MMA	Multilateral Monetary Area
MTFA	Medium Term Financial Assistance
NAFTA	North American Free Trade Area
NCBs	National Central Banks

NIEs	Newly Industrialized Economies
NRU	Natural Rate of Unemployment
NSE	Nigeria Stock Exchange
OAU	Organization of African Unity
OCA	Optimum Currency Area
PRSPs	Poverty Reduction Strategy Papers
RECs	Regional Economic Communities
RHS	Right Hand Side
RTGS	Real Time Gross Settlements
SADC	Southern African Development Community
SAPs	Structural Adjustment Programmes
SARB	South African Reserve Bank
SCF	Stability and Cooperation Fund
SESA	Single Economic Space Agreement
SIC	Schwarz Information Criterion
SOEs	State Owned Enterprises
STMS	Short Term Monetary Support
SVAR	Structural Vector Autoregression
UN	United Nations
VAR	Vector Autoregression
VMA	Vector Moving Average
WABA	West African Bankers' Association
WACB	West African Central Bank

WACB	West African Currency Board
WACH	West African Clearing House
WAEMU	West Africa Economic and Monetary Union (West African CFA Zone)
WAGP	West African Gas Pipeline
WAMA	West African Monetary Agency
WAMI	West African Monetary Institute
WAMZ	West African Monetary Zone
WAUA	West African Unit of Account
WDI	World Development Indicators
WTO	World Trade Organization
ZOCU	Zonal Basket of Currency

Chapter One

Introduction

1. Background to the Study

The quest for price stability (inclusive of the exchange rate), job creation, current balance of payments surplus (or at worst, equilibrium) and sustainable growth by nation states has been the preoccupation of governments since time immemorial. In democratic dispensations, the success or failure of a government in achieving these objectives at any given point in time largely determines whether they should be re-elected. As a result, there is always the need for governments to take a holistic view of the consequences of their policies in that respect, and the decision as to whether or not to join a monetary union is one such key policy that should not be made in a hurry because of the possible ramifications of missed targets.

Globalization presented itself as a conduit through which small and large nations alike could achieve the above-stated objectives through trade with other countries, within and without their geographical boundaries, technological transfer and economic cooperation. The advent of globalization has brought in its wake increased inter- and intra-regional trade, increased foreign direct investment (FDI), free capital movement and free movement of labour, thus calling for greater cooperation among countries than ever before. A glance at global trade statistics¹ indicates that intra-regional trade has and continues to gain prominence in world trade in recent times with the European Union (EU)-12² (now made up of 27 countries) trading more amongst

¹ Various issues of the *World Development Indicators* and the *Direction of Trade Statistics*.

² **EU-12:** Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain and the United Kingdom.

themselves than any other regional grouping in the world. This phenomenon, among others³, has heightened regionalization, thus, calling for more cooperation among countries the world over.

Consequently, the world has seen a proliferation of such regional groupings since the creation of the European Economic Community (EEC) in March 1957 – a move which had more political underpinnings at the time of its creation than economic reasons. Subsequently, many Asian, Middle Eastern, Northern American, Latin American, Caribbean, Eastern European and African countries have constituted themselves into trade and economic blocs with the view of enhancing trade and the general welfare of their peoples. It must, however, be stated that not all the regional groups have witnessed significant growth in intra-regional trade as a result of increased cooperation. Available statistics⁴ indicate that those that witnessed a significant increase in intra-trade volumes after agreeing to regional integration deals are the members of the EU-12, the North American Free Trade Area (NAFTA)⁵, the Association of South-East Asian Nations (ASEAN)⁶ and ASEAN+3⁷. Southern American groups such as Mercosur⁸, however, could achieve only slight increases in intra-regional trade while their counterparts from Africa experienced a downward trend in intra-regional trade. Kenen and Meade (2008, p.2) observed that of all the regions, only Africa experienced a downward trend in intra-regional trade growth between 1990 and 2004. This is not so surprising since Africa has experienced a static (sometimes negative) inter- and intra-continental trade over the past four decades⁹.

³ In many parts of the world, political, cultural and other economic factors, rather than trade, have enhanced regionalization efforts.

⁴ *World Development Indicators* (2006) and *Direction of Trade Statistics* (1997 and 2004) shed some light on this.

⁵ **NAFTA**: Canada, Mexico and the United States of America.

⁶ **ASEAN**: Brunei, Cambodia, Indonesia, Laos PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam.

⁷ **ASEAN+3**: ASEAN plus Japan, Korea and the People's Republic of China.

⁸ **Mercosur**: Spanish acronym which translates into the Common Market of the South. Members are Argentina, Brazil, Paraguay and Uruguay.

⁹ According to Mason and Pattillo (2005), Africa's share of world exports fell from 4 percent in 1980 to 1.6 percent in 2000.

The competitive nature of international trade makes it imperative for countries to adopt efficiency-enhancing measures in order to make their commodities competitive. Cheap and productive labour readily comes to mind. Unilateral efforts on the part of countries have helped to propel some economies to dizzy heights. However, some countries, having done everything in their power to ensure that their commodities stay competitive, have suffered greatly from price instability, which has threatened the competitiveness of their commodities and their economic stability. One price that comes to mind is the exchange rate, described by Eichengreen (1994) as the single most important price because of its ability to alter the prices, in home currency, of all foreign goods against which local producers compete as well as its ability to adjust real prices in the face of sticky wages and prices in the economy.

Because of its peculiar nature, many countries have tried to manipulate the exchange rate in the pursuit of price stability. Others have done so to boost trade and investment, avoid speculative attacks and guarantee the retention of seigniorage profits. However, inaccurate exchange rate policies have brought untold hardships and distress to many countries, leading some to seek some form of international cooperation since unilateral exchange rate policies tend to be risky¹⁰. There is a greater tendency for countries to seek such cooperation to fend off speculative attacks since the international financial system is awash with speculative capital making it virtually impossible for individual countries to be able to withstand such attacks. In that regard, cooperation can at least provide partial insulation.

In recent times, the talk about integration has gone even deeper – beyond integration for trade purposes – to monetary and political integration. Whereas political integration is beyond

¹⁰ Eichengreen (1994) posits that international integration efforts towards dealing with exchange rate volatility stand a better chance of reaping optimum benefits than unilateral efforts because of their failure in times past. Frankel (2004) also takes the same stance by suggesting that East Asian countries would be better off adopting a collective currency peg.

the reach of many regions, for a number of reasons, monetary unification has gained traction lately. For one, monetary unions solve the exchange rate instability predicament. There are many other benefits that monetary unions bring to the countries involved making them attractive to many regional groupings. Discussions are ongoing for the establishment of a monetary union in the Gulf Region, where the Gulf Cooperation Council (GCC)¹¹ members have agreed to establish a monetary union in the near future¹², as well as Southern America, ASEAN, NAFTA and parts of Africa.

Kenen and Meade (2008) specifically mention discussions between Canada and Mexico of a monetary union to complement NAFTA, between Argentina and Brazil of a monetary union to complement Mercosur and in Southeast Asia of a monetary union to complement ASEAN. The formal advent of the Euro Zone in January 1999, and the subsequent issuance of euro notes in January 2002 seem to have given impetus to the efforts of these regional groups to at least make further incursions into the subject matter, and Africa is not being left behind this time around.

Having failed to take advantage of the opportunities provided by globalization and consistently lagging behind in world trade, poverty reduction, economic growth and development, the twenty-first century presents Africa with a brand new opportunity to rectify the mistakes of the past. The Structural Adjustment Programmes (SAPs) and Economic Recovery Programme (ERP) – designed by outsiders to solve domestic economic problems – have come

¹¹ **GCC members:** Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates (UAE).

¹² According to Reuters (published in the Gulf News of June 09, 2008), at the June 2008 GCC meeting held in Doha, Qatar, the countries reaffirmed their support towards the project but concluded that the single currency could not be in circulation by 2010 as planned because of rising inflation due to the ailing dollar (to which most currencies in the region are pegged). However, they agreed to establish monetary institutions to oversee the project before 2010. On June 7, 2009, however, all the countries (except Oman and the UAE) signed a pact to create a joint monetary council. Oman indicated in 2007 that it wanted to retain an independent monetary policy while the UAE pulled out owing to the selection of Riyadh, Saudi Arabia, as the host of the future regional central bank, (www.Bloomberg.com, June 9, 2009).

and gone. Africa seems to be giving an indication that it is ready to take up the growth and development challenge. Recent macroeconomic indicators attest to this assertion, with the region recording the highest average growth globally over the past decade.

Some African countries believe that economic and monetary integration could foster shared growth and have thus committed themselves to various agreements with the view of establishing intra-regional economic and monetary integration. Others are in the process of committing themselves to similar initiatives. But this is not necessarily a recent phenomenon.

Since the time of Kwame Nkrumah of Ghana, Jomo Kenyatta of Kenya and Julius Nyerere of Tanzania, who are considered the pioneers of African liberation and unity, there has been talk of uniting all of Africa on all fronts – politically, socially and economically – as a way of weaning the continent from dependence on the West. The formation of the Organization of African Unity (OAU) in 1963, which eventually metamorphosed into the African Union (AU) in July 2002, buttressed the commitment of member states to achieving this ambitious project¹³. Among the many discussed modalities of achieving this objective was the establishment of a single monetary zone – the establishment of an African central bank and the use of a single currency by all Africans.

Consequently, the (O)AU has been encouraging the creation of monetary unions in the existing regional economic communities – the Arab Maghreb Union (AMU)¹⁴, Common Market for Eastern and Southern Africa (COMESA)¹⁵, Economic Community of Central African States (ECCAS)¹⁶, Economic Community of West African States (ECOWAS)¹⁷ and Southern African

¹³ AU comprises 53 African countries. Discussions were held in Lusaka, Zambia, about the rebranding of the OAU in July 2001. The new organization, the AU, was inaugurated in July 2002 in Durban, South Africa.

¹⁴ **AMU members:** Algeria, Libya, Mauritania, Morocco and Tunisia.

¹⁵ **COMESA members:** Angola, Burundi, Comoros, Congo DR, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia and Zimbabwe.

¹⁶ **ECCAS members:** Angola, Burundi, Cameroon, Central African Republic, Chad, Republic of Congo, Congo DR, Gabon, Rwanda (left in 2007) and Sao Tome and Principe.

Development Community (SADC)¹⁸ – to serve as a launching pad for the eventual creation of an African central bank and single currency.

This, among other reasons, gave birth to the ECOWAS in May 1975. Consequent to the establishment of the ECOWAS was the creation of the West African Clearing House (WACH) in 1975¹⁹, “To promote the use of the currencies of member countries in sub-regional trade and to encourage the members of the Clearing House to liberalize trade and promote monetary and economic consultations among themselves”, (Ojo²⁰ 2003). The West African Unit of Account (WAUA), a benchmark for determining the relative strength of the currencies in the WACH payment and clearing mechanism, was also introduced to provide momentum to the WACH.

Aside from strengthening intra-trade relations among countries in the West African sub-region and the enhancement of their ability to export and attract FDI as one people, there has been much emphasis on the use of a single currency to make their quest for economic cooperation a reality. This led to the establishment of the ECOWAS Monetary Cooperation Programme (EMCP) in 1987 with the aim of harmonizing the monetary system vis-à-vis the strengthening of the economies in the sub-region. Furthermore, WACH was transformed into the West African Monetary Agency (WAMA) in 1996 to consolidate the gains of WACH, plug the inadequacies thereof and ultimately pave the way for the emergence of a single monetary zone in the sub-region. However, structural bottlenecks and members’ non-commitment to the process resulted in the target date for the single monetary zone to be shifted many times from 1992 to 1994, 2000, 2004 and presently, 2020.

¹⁷ **ECOWAS members:** Benin, Burkina Faso, Cape Verde, Côte d’Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania (left in 2000) Niger, Nigeria, Senegal, Sierra Leone and Togo.

¹⁸ **SADC members:** Angola, Botswana, Congo DR, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Kingdom of Swaziland, Tanzania, Zambia and Zimbabwe.

¹⁹ WACH commenced operations in July 1976.

²⁰ Ojo was a one-time Director General of the West African Monetary Institute.

West Africa already has one monetary zone in the West African Economic and Monetary Union (WAEMU), which comprises eight countries, most of which belong to Francophone West Africa²¹. They use the CFA franc²² as their official currency and are heavily supported by the French government. However, the non-French speaking (Anglophone) West African countries, in addition to the Republic of Guinea and Cape Verde, consigned themselves to using their own national currencies after independence²³. Five countries – The Gambia, Ghana, Guinea, Nigeria and Sierra Leone – out of the remaining seven (the last one being Liberia) consented, in December 1999, to initiate moves that could see the formation of the West African Monetary Zone (WAMZ), a project that with time will witness the creation of a single central bank and the issuance of a single currency for the five countries and the whole of West Africa in what was described as the “fast-track approach”.

This has resulted in the setting up, in January 2001, of the West African Monetary Institute (WAMI), the Institute which would undertake technical preparations for the establishment of a common West African Central Bank (WACB), with its headquarters in Accra, Ghana. Member states set for themselves a set of convergence criteria with the view that its achievement would lend credibility to the entire project.

Originally billed to be issued in January 2003 and postponed to July 2005, then to December 2009 and later to 2015, the eco – the planned single currency – has been hit with delays due primarily to the inability of the member countries to meet the original primary set of convergence criteria stated as follows²⁴:

²¹ Guinea-Bissau (colonized by Portugal) is the only non-French-speaking country among the eight countries.

²² There are two CFA franc zones in Africa – the other one is located in Central Africa.

²³ Guinea is a former French colony and Cape Verde is a former Portuguese colony.

²⁴ The December 2009 deadline was missed due to worsening macroeconomic conditions in the countries attributable to food price increases in 2007/2008, falling commodity prices and the effects of the 2008 global financial crisis.

- a) single-digit inflation by the end of 2000 and an inflation rate of no more than 5 percent by 2003
- b) gross foreign currency reserves to cover at least three months' worth of imports by the end of 2000 and six months' worth by the end of 2003
- c) central bank financing of the budget deficit limited to 10 percent of the previous year's tax revenue; and
- d) a maximum budget deficit-to-GDP ratio of 5 percent by the end of 2000 and 4 percent by the end of 2003.

This study seeks to ascertain the desirability and feasibility of the WAMZ by examining the challenges and prospects of a single monetary policy on their economies. It also seeks to establish whether the countries constitute an optimum currency area (OCA) and whether they would be able to conform to the dictates of sustaining the monetary zone against the backdrop of their inability to meet the convergence criteria, a testament of a long history of fiscal indiscipline, political instability and the failure of previous attempts to achieve monetary unification.

1.1 Statement of the Research Problem

The idea of a West African monetary union has been triggered by the desire to counteract perceived economic weakness and the prospects of being able to negotiate favourable trading arrangements, since individual West African countries are geographically and economically small. There is a notion that with a population of over 270 million, the sub-region would be better able to make a case for itself if member states worked together. But to achieve this, the 188 million population of the WAMZ has to prove their ability to achieve macroeconomic stability before they can expect the WAEMU to join them to make this a reality.

As stated previously, the formal advent of the Euro Zone in January 1999 and the subsequent issuance of euro notes in January 2002 seem to have given momentum to the West African project. But questions still remain as to whether the time is ripe for a full-fledged monetary union to be created in the sub-region because of the possible repercussions that failed monetary policies could have on individual countries in the future. Is it time yet for the WAMZ?

This study seeks, with the aid of macroeconomic data, theoretical and empirical literature and econometric tools, to answer the following questions:

- a) Do the WAMZ countries constitute an optimum currency area?
- b) Do they have shocks co-movement? If not, how do individual countries and the WAMI intend to handle asymmetric (idiosyncratic) shocks?
- c) Can they achieve price convergence, shocks synchronicity and trade integration *ex post*?
- d) Are there other ways of achieving the objectives of the WAMZ apart from monetary unification?

1.2 Objectives of the Study

As members of one of the most troubled sub-regions on the African continent (with corruption, political instability and economic mismanagement still prevalent), is it possible for the WAMZ to form a monetary union and be able to sustain it? This study seeks to:

- a) provide a basis for the fast-tracking or postponement (or at worst, the outright abolition) of the WAMZ project
- b) suggest ways by which the project could be sustained if there is the need for it at all; and
- c) suggest alternative ways of achieving some, if not all, of the intrinsic benefits of monetary unification.

1.3 Significance of the Study

Monetary unification is more or less a project of a lifetime – there are usually no escape clauses. As a result, all the necessary avenues must be explored in order to ensure that the decision to enter into it is the right one. Very limited research has been carried out on the eco and the WAMZ as a project although lots of studies have been conducted on Europe’s Economic and Monetary Union (EMU), the WAEMU, the proposed Asian Monetary Union and the sub-region-wide ECOWAS monetary union by Mundell (1961 and 1973), Bayoumi and Eichengreen (1994), Frankel and Rose (1998), Barro (2004), Mason and Pattillo (2004 and 2005), Kenen and Meade (2008) and others.

The issue of whether the WAMZ constitutes an optimum currency area is one that needs to be investigated before bringing this project into reality. This study seeks to answer this question and postulate recommendations for policy considerations for the eventual well-being of the West African sub-region.

1.4 Methodology

The study uses both qualitative and quantitative analyses by making extensive use of secondary time series data to calibrate the models. The models are drawn from the empirical studies reviewed in the literature, spanning vector autoregressive (VAR) to panel data regression models, which are adapted to suit the unique characteristics of the WAMZ. The study sought to establish the *ex ante* and *ex post* achievement of the OCA criteria through the analyses of demand, real exchange rate and supply shocks co-movements among the five countries using

variants of the Blanchard and Quah (1989) model. It also assesses trade endogeneity in the WAEMU to confirm or negate the claims that trade enhancement can be achieved *ex post*.

Supply shocks co-movements are indicative of the presence of similar industrial structures and high levels of trade among countries. One benefit of having supply shocks co-movements is that countries are more likely to experience non-idiosyncratic or symmetric shocks. In this case, a single monetary policy could deal simultaneously with such shocks in all countries involved. Similarly, one could argue that the existence of demand shocks co-movements could, to some extent, make it easier for one-size-fits-all monetary policies to achieve their goals; and real exchange rate shocks co-movements also validates the institution of a common exchange rate policy like a monetary union and other multilateral exchange rate arrangements even though this is not always the case.

The study also makes use of the gravity model to establish *ex post* trade intensity, what has become known as the endogeneity of OCA, among the countries under study. The model, based on Newton's Law of Gravity, has been adopted by economists as a tool for analyzing trade flows and migration.

1.5 Data Sources and Quantitative Tools

The paper makes use of an extensive resource of time series data from the following sources:

1. World Bank's *World Development Indicators* (WDI): Yearbook and CD-ROM 2008
2. IMF's *Direction of Trade* (DOT) Statistics: Yearbook and CD-ROM 2009
3. IMF's *International Financial Statistics* (IFS): Yearbook and CD-ROM 2009
4. ECOWAS publications; and

5. WAMZ publications

The following are the quantitative software packages employed in the study:

1. Microsoft Excel
2. Statistical Package for the Social Sciences (SPSS)
3. Stata; and
4. Econometric Views (EViews).

1.6 Limitations of the Study

The study does not do an extensive analysis of the political pull factors that drive the decision to join a monetary union in the econometric methodology, even though it is discussed extensively in chapters 2 and 3. Data limitations, especially for Guinea, limited a thorough analysis involving all of the countries. The results, especially the supply shocks correlations, indicate that more degrees of freedom can change the results. However, both the *IFS* and *WDI* do not have adequate pre-1980 data on Guinea. Furthermore, since bilateral trade data, as drawn from the *DOT*, does not account for informal trade flows within the West African sub-region, there is a gross underestimation of the real volume and value of trade in the West African sub-region.

In the section that analyzes an alternative to a monetary union, more specifically, an anchor-type exchange rate union, the characteristics of the model employed made it difficult to incorporate both the United States' shocks and those of the twelve Euro Area countries in the same model. As such, two separate results, one for the US and the other for the twelve Euro Area countries, are generated and the two economies' relative strengths in explaining business cycles

and price changes are used to determine which of them has the greater influence on the WAMZ. A specification that combines the two into a single model would have been preferable since they both have a great influence in the WAMZ.

1.7 Outline of the Study

The study has been organized into seven chapters, of which this is the first. It covers the background to the study, the statement of the research problem, objectives of the study, its significance, methodology, limitations and an outline of the study. Chapter two embodies a review of both the theoretical and empirical literatures on the subject matter. It reviews the politics and economics of monetary unions. Under economics, it takes a look at the OCA theory, which is the bedrock of this study, and analyzes the Mundell and post-Mundell literature flanking the theory. Under politics, the study takes a brief look at the political factors that would cause a group of countries or an individual country to decide to join a monetary union. Furthermore, extensive coverage is given to the various unilateral exchange rate arrangements available to countries leading up to permanently fixing the exchange rate (in a monetary union).

The chapter also reviews past, present and future monetary unions as well as pseudo monetary unions with particular attention on the Euro Area, the CFA zone, the Common Monetary Area (CMA) and the WAMZ while discussing the various monetary unions. It also reviews the processes leading up to the EMU from the Werner Plan of 1970 to the Delors Report. Finally, the chapter reviews a plethora of existing studies that have been conducted within the domain of monetary unions bordering on the Euro Area, ASEAN and the CFA zone as a guide to this study.

The third chapter discusses the antecedents of the WAMZ, starting from the integration efforts made by the forebears of the (O)AU to that of ECOWAS and finally, to the WAMZ. The chapter then does an in-depth analysis of the WAMZ economy, in an attempt to assess its readiness for a monetary union based on the history of its political-economy.

Chapter four then discusses the methodological approach to the study. It specifies the econometric models, defines the estimable variables, discloses the data sources and explicates the estimation procedure. Chapter five is where the empirical models are estimated and the results are explained. It is the core of the paper since most recommendations and conclusions are drawn from it. It discusses both *ex ante* and *ex post* OCA analytical findings by looking into shocks co-movements before and after monetary unification. On the *ex post* front, the chapter ascertains whether the sub-region could gravitate towards symmetric shocks and attain all the benefits there are in monetary unification after monetary unification. Based on the results in chapter five, chapter six presents an alternative exchange rate arrangement which could be put in place in lieu of a monetary union in the short-to-medium term as the countries await the final decision to form a monetary union. Finally, chapter seven, the concluding chapter, gives an account of the summary, conclusions and recommendations based on the study results.

Chapter Two

Review of Existing Literature

2. Introduction

The turn of the millennium has unleashed a myriad of opportunities as well as risks in the international trade and financial arenas, causing an intense desire for independent nation states to gravitate towards making coordinated efforts aimed at augmenting the benefits of globalization and seeking solutions to the challenges thereof, as opposed to unilateral approaches. International organizations such as the United Nations (UN) and its allied agencies, the World Trade Organization (WTO), the International Monetary Fund (IMF), the World Bank, amongst others, were set up with the view of soliciting for concerted efforts to deal with global issues of such nature. However, the existence of these and other international organizations was not meant to preclude regionalization – a trend which has been on the ascendency over the past few decades owing, in part, to the inability of these organizations to exhaustively address some of the concerns of member countries. One such challenge relates to exchange rate volatility and its concomitant impact on trade.

The world's financial system is awash with mobile capital, making countries ponder ways by which they can avoid a situation caste in the mold of the 1997-1998 Asian²⁵ or the 2008 global financial crises. One way of dealing with this phenomenon is through international monetary arrangements such as exchange rate unions and monetary unions.

This chapter reviews both theoretical and empirical literatures related to the exchange rate arrangements, unilateral and otherwise, which have been experimented with in times past and eventually throws more light on monetary unions. It begins by reviewing one of the

²⁵ The Asian financial crisis is believed to have been caused by speculative capital, Eichengreen (2004) and Frankel (2004).

headaches of the international financial system, exchange rate risk, and discusses a component of the firm fix corner²⁶, monetary unification (which is the bedrock of this study), and also takes a look at the optimum currency area (OCA) paradigm *vis-à-vis* monetary unification by analyzing the Mundell and post-Mundell literatures flanking the theory. It briefly reviews the political and economic motivations for monetary unification and reviews the events leading up to the Economic and Monetary Union of Europe (EMU). It finally zeroes in on a plethora of existing studies that have been conducted within the domain of the OCA theory (and by extension monetary unions) in reference to the Euro Area, the Association of South-East Asian Nations (ASEAN), the CFA zone and the West African Monetary Zone (WAMZ).

2.1 Theoretical Literature

The conventional economic aims for any monetary union are higher growth and price (inclusive of the exchange rate) stabilization, which is a desirable trait for small and open economies. These two factors happen to be intertwined with two others as the four main themes of macroeconomics, the others being unemployment and Balance of Payments (BOP). A painstaking analysis will reveal that economic growth and price stability have reciprocal effects on each other. Output growth, *ceteris paribus*, engenders higher employment and price stability also encourages investment and in a way ensures export competitiveness²⁷. It is therefore not surprising that discussions on monetary unions have become economically and politically appealing.

Rose (2000) establishes that bilateral trade between countries that use the same currency is, controlling for other effects, over 200 percent larger than between countries which have

²⁶ This is one of the sub-categories of the two main exchange rate regimes that are discussed later.

²⁷ If other currencies appreciate and the local currency keeps still.

multiple currencies. Many other studies have confirmed higher as well as lower percentages²⁸. Masson and Pattillo (2005) maintain that the members of the CFA zone experienced significantly lower inflation than the rest of sub-Saharan Africa because of their adherence to common monetary rules and relative fiscal disciplinary measures. These are some of the desirable traits of monetary unions.

A monetary union is an exchange rate arrangement that seeks to perpetually fix the exchange rate among countries in a union. It is not the only international arrangement that can ensure price, and for that matter exchange rate, stability. An international arrangement as well as unilateral policies on the exchange rate can also help stabilize prices, at least for a period of time. The OCA paradigm, upon which this study is premised, seeks to aid the discussion of a country's eligibility to join an international exchange rate arrangement.

The exchange rate is a very important price because of its ability to effect adjustments in cases whereby wages and prices are rigid. To paraphrase Eichengreen (1994), the exchange rate is the single most important price in the economy because of its ability to alter the prices, in home currency, of all the foreign goods against which local producers compete. Consequently, he argues that successful exchange rate arrangements must be able to achieve the following:

- a) the ability to effect relative price adjustments
- b) compatibility with the pursuit of robust monetary policies; and
- c) a capacity to contain market pressures.

Exchange rate stability, as has been proven by many studies, is desirable for international trade²⁹. For export-oriented countries, exchange rate fluctuations come at a great cost owing to

²⁸ Frankel and Rose (2002), Engel and Rose (2002), Persson (2001), Klein (2002), etc.

²⁹ For example, Wyplosz (2004, p.257) and Eichengreen (2004, p.49) underscore why East Asian countries have a preference for exchange rate stability.

exchange rate risk. As a result, countries have sought to employ the right kind of exchange rate regime to facilitate the achievement of certain economic goals. Some have succeeded while others have failed. This can be attributed to a number of factors, some of which are articulated in the succeeding paragraphs. But as Eichengreen (2004), and corroborated by Frankel (2004), puts it, “No single exchange rate arrangement is likely to satisfy all competing demands placed upon it... an implication of the fundamental ‘trilemma’ of international economics.” The trilemma is outlined as:

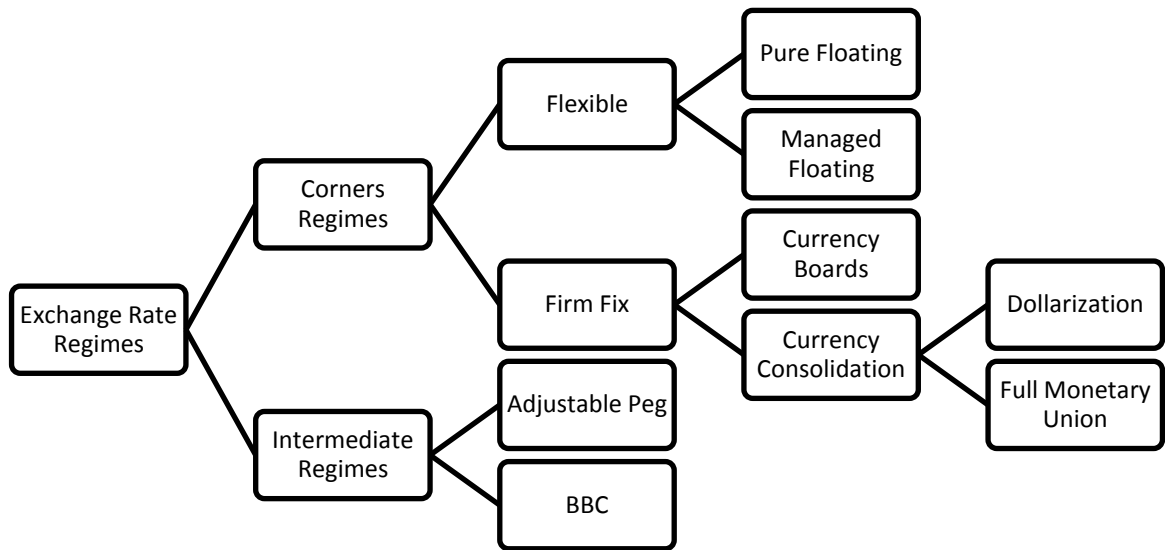
- a) stable or pegged exchange rates
- b) freedom to borrow and lend (i.e. capital mobility); and
- c) domestic monetary policy autonomy.

A maximum of two of the above three can be achieved at a time, thus their being referred in certain quarters as the “impossible trinity.” This is mainly because capital mobility has gained notoriety for destabilizing stable exchange rate regimes – the Asian financial crisis of 1997 is a classic example of this assertion.

There are two broad categories of exchange rate regimes. This categorization, based on Eichengreen (1994), Frankel (2004) and Rogoff (2001) are presented in Figure 2.1. The broad categories are:

- a) the corners regimes; and
- b) the intermediate regimes.

Figure 2.1 Exchange Rate Regimes



2.1.1 The Corners Regimes

The corners regimes – also called hollowing out, the hypothesis of the vanishing intermediate regime, among others – refers to the alternative of flexible or firm institutional fix regimes. It is so called because of the fact that its two components lie at the extreme ends of the spectrum of the middle ground (or the intermediate regimes).

Flexible Exchange Rate Regime

Flexible exchange rate regimes, so called because of limited interventionism or the lack of it, is made up of two categories: pure floating and managed floating. The pure floating regime (a variant of the goods market laissez-faire mechanism) is one whereby the local currency is allowed to float against all other currencies without the direct intervention of the monetary authority or government. Thus, its value is determined by the forces of demand and supply. Similarly, a managed floating regime is also left to the market forces to determine, however, the

monetary authority reserves the right to intervene under extreme conditions. Williamson (1996, 2000b) defines it as one in which intervention “is episodic, ad hoc, not planned according to any pre-considered strategy or agreed in advance, and whose parameters are not only not announced to the market but not even known to the authorities.” The main difference between this regime and some of the intermediate regimes (e.g. target zones) is that there are no pre-announced bands beyond which intervention would be inevitable. Moreover, the amount of resources and the period of intervention are not based on any explicit exchange rate targets, and as a result are not announced by the monetary authority. The discretionary nature of interventionism, as opposed to the regulatory nature of intermediate regimes, makes it possible for managed floating regimes to avoid certain unwarranted costs that result from committing resources to deal with transitory fluctuations.

Like all other economic policies, the flexible regime has its own advantages and disadvantages. Generally speaking, this regime serves as a buffer against exogenous shocks, be they real or nominal, because of the non-prohibition to oscillations, thus, making adjustments relatively easier. In the case of export difficulties, the exchange rate can adjust by depreciating to make the export price relatively cheaper. It also allows for the pursuit of an independent monetary policy, one based on discretion rather than on rules. For instance, the pursuit of rigid rules could mean that the central bank would have to embark on a restrictive monetary policy to curb inflation even if there is the need to expand money supply in order to create jobs to boost demand and growth. But because of the overriding nature of such monetary rules, employment creation could be sacrificed. Finally, the exchange rate risk associated with flexible exchange rates could dissuade excessive inflow of speculative capital, thus, forestalling asset price bubbles.

On the other hand, flexible regimes are prone to volatility, which makes planning difficult. In addition, exchange rate volatility could repress trade and investment due to exchange rate risk. It also complicates monetary policy because it eliminates the use of the exchange rate as a nominal anchor, as in the case of a peg, for policy makers. This could lead to macroeconomic indiscipline unless another target, such as inflation, is adopted to fill the void.

In a discussion on the appropriate exchange rate regime for small open economies, McKinnon (1963, p.719) posited that:

“...if we move across the spectrum from closed to open economies, flexible exchange rates become both less effective as a control device for external balance and more damaging to internal price stability.”

By this, he sought to suggest that small open economies with few non-tradable goods will be better off in firm fix regimes in order to forestall income volatility, which are primarily caused by variations in the exchange rate. This leads us to the other alternative in the corners regimes.

Firm Fix Regime

Also called hard pegs or firm institutional fix regimes, firm fix regimes are associated with institutional supervision which makes it difficult for the commitment to fix to be overturned. For instance, if pegs are legislated and only a supermajority in parliament can overturn it, it could qualify to be a firm fix. Furthermore, if a body is established with the sole aim of maintaining the peg, or there is perpetual pegging of a currency or a group of currencies in such a way as to make the reversal of the policy costly, these could also qualify to be in this category. As per Figure 2.1, there are two main sub-divisions of this regime: currency boards and currency consolidation.

Currency Boards

A currency board is a monetary authority whose mandate is to issue domestic notes and coins and maintain a peg to a hard currency without serving as a lender-of-last-resort or being the government's bank. Masson and Pattillo (2005) define it as a situation "...in which a country pegs to another currency with zero margins, (where) the link between the two currencies is institutionalized through a mechanism that limits the money supply in the currency board country to the quantity of reserves held in the other currency." Kenen and Meade (2008) put it thus, "A currency board is obliged to hold foreign currency assets at least as large as its monetary liabilities, and must stand ready to swap home for foreign currency, and vice versa, at an irrevocably fixed price." To be able to maintain the exchange rate fix, the currency board retains at least enough of the reference hard currency capable of buying, at the minimum, all the local currency in circulation (i.e. narrow money supply).

Enoch and Gulde (1998) spell out three elements of a currency board as "...an exchange rate that is fixed to an anchor currency, automatic convertibility (that is, the right to exchange domestic currency at this fixed rate whenever desired) and a long-term commitment to the system, which is often set out directly in the central bank law." Currency boards, in pursuing exchange rate stability, track anti-inflationary policy. They are known to have delivered low inflation and lower interest rates through time, even though there are some exceptions. They inject credibility into the economy since they do not bail the fiscal authority out, as typical central banks sometimes do. However, they limit policy maneuverings by the fiscal authority because they keep exchange rate and interest rate adjustments out of its reach. This could affect

demand and employment. It could also prove detrimental if the anchor currency begins to appreciate like the case of Argentina in 2001³⁰.

Currency Consolidation

Dollarization or eurorization and monetary unions fall under this category. They are both referred to as currency consolidation because of their penchant to reduce the number of independent currencies that circulate within a region. As Kenen and Meade (2008) put it, the two significant merits of currency consolidation are “gains in efficiency and gains in credibility.” In the first case, the issue of currency convertibility and the loss of revenue due to exchange rate transactions become a thing of the past, making it easier to buy and sell in the region and enter into contractual agreements without fear of the loss of value due to exchange rate changes, while in the second case, credibility to maintaining the perpetual fix is a near certainty since it becomes intrinsic. That said, currency consolidation can suffer crisis if the wrong currency is adopted as an anchor or a country joins a crisis-prone monetary union.

Dollarization

When a nation aims to permanently fix the exchange rate between itself and another country by forfeiting its own currency and adopting that of the country in question, it is referred to as dollarization or eurorization, depending on whether the dollar or euro is adopted as the anchor currency. In this case, the country virtually leaves the conduct of monetary policy in the hands of the anchor country. Examples of dollarizers are Panama and Ecuador, which have adopted the US dollar as their domestic currency. It is advisable for countries which seek such an

³⁰ The international revaluation of the dollar, the devaluation of the Brazilian real and the speculative attacks that ensued led to a massive financial crisis in Argentina. This led to the abandonment of the currency board with the US dollar as the anchor currency.

arrangement to adopt the currency of a country which is its major trading partner, otherwise, there is a high tendency that they may experience asymmetric shocks. In the event that they experience differential shocks, the smaller country might be disadvantaged since the monetary authority in the anchor country will seek to correct its misalignments first. This move could exacerbate the situation in the smaller country. On the brighter side, a country that is struggling to contain inflation could achieve a stable inflation rate by adopting the currency of a country which has distinguished itself at stabilizing inflation.

Monetary Union

Masson and Pattillo (2001) define a monetary union as “...a zone where a single monetary policy prevails and inside which a single currency or currencies which are perfect substitutes circulate freely.” A *full* monetary union is one where a group of countries consents to abandon their respective currencies for a common (hitherto non-existent) one and creates a new monetary authority (usually a central bank) with currency issuing powers, thus, effectively giving up independent monetary policy³¹. It is one way of perpetually fixing the exchange rate amongst countries such that discontinuing any one country’s membership is financially costly to such a country. In this arrangement, the hitherto independent central banks become branches of a newly-created regional central bank which creates a one-size-fits-all monetary policy for all of the countries involved.

³¹ There are various definitions of monetary unions. The study later takes a look at these other definitions. However, as per the Euro Area and the WAMZ, the qualification ‘full’ is used to distinguish this type from the others.

2.1.2 The Intermediate Regimes

Eichengreen (1994) argues that a successful exchange rate policy is one that is able to combine the advantages of both fixed and flexible exchange rates by providing stability, predictability and anti-inflationary credibility. The one advantage fixed exchange rates have is their ability to minimize the disruptions caused by exchange rate volatility; and that of flexible exchange rates is that it puts policymakers on the alert to provide policy initiatives to insulate the economy from disturbances. To this end, it might look attractive, at least on the surface, to choose from the gamut of options in the intermediate regimes since they combine aspects of the fixed and flexible exchange rate regimes. This regime seeks to limit, rather than remove exchange rate flexibility and to relax rather than jettison fixing. There are basically two sub-groups under the intermediate regimes – the basket, band and crawl (BBC) regimes, attributable to Williamson (1996), and adjustable pegs.

Depending on the definition, each intermediate regime can behave like a flexible regime or like a fixed regime. Therefore, the definition of the width of the bands, the degree of rigidity, the situation that would call for an intervention and the circumstances that might warrant the invocation of an escape clause must be fully understood.

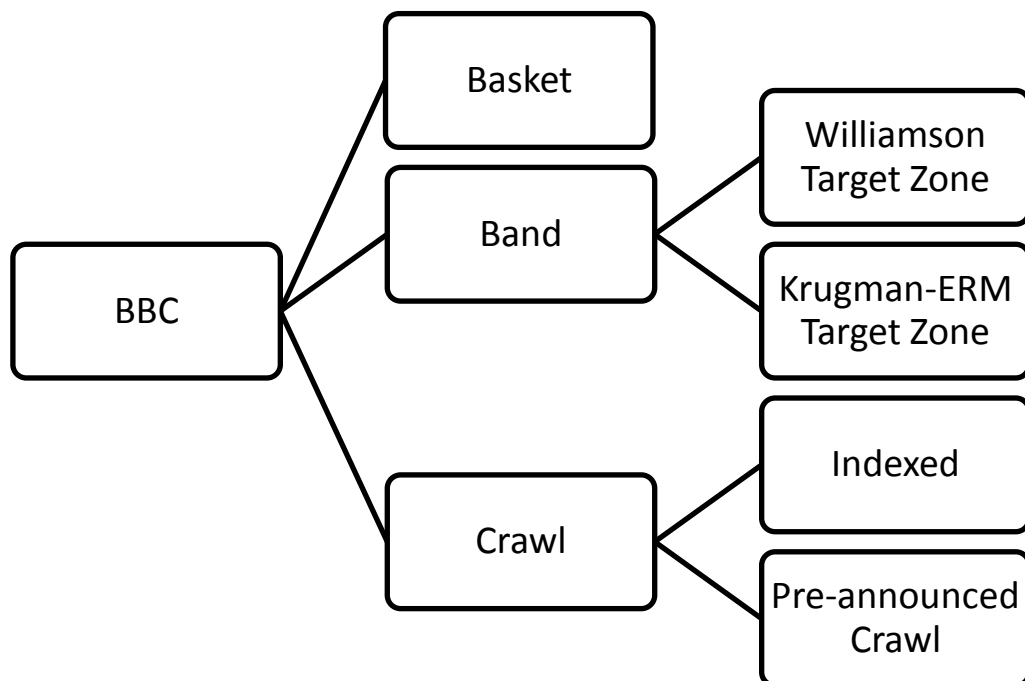
“In the case of crawl, it is the speed of crawl; in the case of the basket, it is the number of currencies in the basket and the extent to which the weights are publicly announced; and in the case of the adjustable peg, it is the magnitude of the shock necessary to trigger the change in the parity,” (Frankel, 2004).

The succeeding paragraphs discuss the BBC regimes and their respective sub-divisions.

The Basket, Band and Crawl Regimes

The BBC regimes are distinguished based on the band width and variability of the bands. Depending on their definition, there could be other sub-categories, however, this study limits the sub-regimes as indicated in Figure 2.2.

Figure 2.2 The BBC Regimes



Currency Basket Regime

The currency basket regime involves a collection of currencies to which currencies within a region are pegged. The currencies in the basket could be regional currencies only, regional and non-regional currencies or non-regional currencies only, depending on the preferences of the countries. The argument for a currency basket is that since it would not be out of place for a country to peg its currency to its trading partner (supposing there was only one trading partner), it would be in the right direction for a country to seek to peg its currency to those of all its

important trading partners, since there is more than one in reality. Williamson (2000a) argues that it would be advisable for countries with diversified trade to peg to a currency basket, rather than to a single currency, in order to stabilize their effective exchange rate. He argues that it might insulate such countries from the effects of foreign currency volatility on their trade, output and inflation. It must be said, however, that the components of the basket must be informed by the extent of trade relations with the countries whose currencies are in the basket, since it increases the chance of price and output co-movements. There are basically three methods of linking currencies to a currency basket – linking the currencies to a currency basket made up of regional currencies and linking the basket to external currencies, creating a basket made up of regional and non-regional currencies and linking their respective currencies to it³², or linking the currencies directly to a basket of foreign currencies. A typical contemporary example of a currency basket is the European Currency Unit (ECU).

A notable drawback of the currency basket regime is its complex nature. The modalities for assigning weights to each currency in the basket may not be intelligible to most people as opposed to a regular fixed or floating exchange rate regime. This raises the question of transparency, which could serve as an assurance to the public of the monetary authority's commitment to sticking to its policy goals, as a way of managing their expectations. Furthermore, basket regimes, like most intermediate regimes, are crisis-prone due to the potential impact of speculative capital.

On a positive note, currency baskets draw their strength from their ability to stabilize the exchange rate, with its concomitant effect on trade. They prevent competitive devaluation or what has become known as beggar-thy-neighbour policies; and because of their ability to deliver stable exchange rates, they have the tendency to attract investment capital.

³² The first two are found in Ogawa *et al* (2004).

Bands or Target Zones

The exchange rate band regime, largely referred to as target zones, combine elements of pegged and floating rates in such a way that allows the rate to float freely within defined parameters (bands) beyond which intervention becomes necessary. In other words, when the rate drifts from the central rate and nears the corners of the predetermined bands, there is the likelihood that the monetary authority might intervene to ensure that it stays within the bands. For target zones to work effectively, the monetary authority must be seen to be credible, otherwise, speculative attacks will be rife.

Krugman (1991a) developed a model which defined a kind of a target zone whose success, more or less, hinged on the credibility of the monetary authority. He argued that, given a target zone, the expectation that the monetary authority would intervene if the rate gets closer to the band “exerts a stabilization effect on exchange rate behaviour within the band” even without the actual intervention of the authority. That is to say, if the monetary authority has a track record of being credible, the public (including speculators) will rest easy whenever the exchange rate drifts from the central rate knowing that the authority will intervene to bring it back to the pre-determined rate. This reduces speculative attacks even when the monetary authority does not actually intervene in the market.

Williamson (1996) on the other hand, proposed a target zone with wide margins (usually interpreted to mean ± 10 percent or ± 15 percent) in order to make more room for the rate and to forestall unnecessary interventions in cases of temporary fluctuations. He gave a number of reasons for this.

“...to permit the parity to be adjusted, to keep it in line with the fundamentals, without provoking expectations of discrete exchange rate changes that might

destabilize the markets... to give some scope for an independent monetary policy, to be used for anti-cyclical purposes when a country found its cycle out of sync with the world norm... to help a country cope with strong but temporary capital inflows,” (Williamson, 2000b).

Williamson (1985) again posits that for the BBC regimes (and for that matter, target zones) to be successful, they must have “soft margins” in such a way that governments would not feel obligated to intervene whenever the currency comes under attack. He suggests that the rate should be allowed to go beyond publicly announced bands at times, with the government communicating its readiness of intervention at a certain point in time.

Like the basket regime, exchange rate bands are also susceptible to speculative attacks. The very existence of the bands presents an incentive for speculative attack. Just like all intermediate regimes, this option thrives on credibility without which there will be a “target zone divorce³³.” On the brighter side, they are able to combine minimum variability and stability, a characteristic that is evasive to the two alternatives in the corners solutions.

Crawl

The crawl is a special type of a band whereby the margins are allowed to shift in response to changes in certain variables and conditions in the economy. Indexed crawls are usually associated with inflation, a situation where the margins are allowed to change as prices change in order to neutralize the inflation differential. For example, crawls with inflation-indexed bands are allowed to shift when local inflation exceeds foreign inflation. When the rate of the crawl is announced, that constitutes a pre-announced crawl. However, sometimes the rate of crawl can be altered to help sustain equilibrium. Crawls help to achieve the real appreciation that an economy

³³ Eichengreen (1994).

needs to maintain equilibrium in rapidly expanding economies but are vulnerable to speculative attacks.

Adjustable Pegs

Pegs are narrow target zones. That is to say, the bands are narrower than those of target zones, as a result of which they might be subject to frequent interventions. Fixes that are not institutionally backed are, by and large, pegs that belong to the intermediate regimes. The distinction is that, under exceptional circumstances, these pegs are adjusted in order to pre-empt the real exchange rate from getting out of hand. Most countries in Africa, Asia and South America have at one point in time adopted this regime.

The one notable advantage it has is that it stabilizes the exchange rate, thus, facilitating export trade. In a situation where the currency is undervalued, it has the tendency to boost exports but when it becomes overvalued, it serves as a disincentive to exports and rather boosts imports.

2.1.3 The Concept of Monetary Integration

Monetary or currency integration has been defined in several ways by various authors. However, what it seeks to do is to fix the exchange rate between two or more countries such that transaction costs that are related to the exchange rate (primarily as a result of the maintenance of independent currencies) are either completely removed or reduced to the barest minimum. Corden (1972, p.2) outlines two components of monetary integration as exchange rate union, where the exchange rate is permanently fixed among the countries' currencies; and convertibility, whether all exchange rate controls for both current and capital transactions are done away with.

In consonance with this assertion, El-Agraa (2007) identifies two primary components of monetary unions – exchange rate union and capital market integration. He argues that every monetary integration effort must be underpinned by:

- a) an explicit harmonization of monetary policies
- b) a common pool of foreign exchange reserves; and
- c) a single central bank or monetary authority.

Masson and Pattillo (2005) delineate five different kinds of monetary integration based on the works of Emerson *et al* (1992), Cobham and Robson (1994) and Hawkins and Masson (2003). They underscore that each of the five categories involves current and capital account convertibility, but are distinguished from each other as a result of the existence of independent currencies and/or central banks and whether the parities (which is characteristic of such arrangements) are perfectly fixed. The first three were suggested by Emerson *et al* (1992) and Cobham and Robson (1994) in separate studies commissioned by the European Commission as a precursor to the EMU. Hawkins and Masson (2003) saw it necessary to add the last two.

Type I: The authors describe the first one as an *informal exchange rate union* which does not necessarily lead to the abolition of individual currencies but fixes them within margins such that their parities can be adjusted as and when the situation calls for it.

Type II: The second one is referred to as a *formal exchange rate union* and involves separate currencies whose parities fluctuate within narrow or zero margins capped with a high degree of coordination between the central banks in the union. A typical example of this type is the CMA regime in Southern Africa.

Type III: This involves a single currency (usually previously non-existent) and central bank for all the countries involved. It is called a *full monetary union*.

Types IV and *V* are dollarization and currency boards respectively. These have already been discussed.

The table below depicts some existing and defunct monetary unions in the world classified into the various types discussed above. The first four are/were located in Africa and the last one is the EMU. Out of the four in Africa, the West African Currency Board (WACB) and the East African Currency Board (EACB) are defunct, while the CFA zone and CMA are still in operation. The EMU is discussed further in this chapter and the first four are dealt with in chapter three.

Table 2.1 Defunct and Existing Monetary Unions

Monetary Union	Date	Type	No. of currencies	Name of currency	Other integration efforts	Reason for dissolution
CFA Zone:	1945 to present	Type III	Single	CFA franc	Customs union	Still exists
WAEMU and CEMAC						
WACB	1907 to 1964	Type V	Single (until 1965) and multiple	British pound (until 1916) and West African pound	None	Political independence
EACB	1919 to 1977	Type V	Single (until 1966) and multiple (until 1961)	East African shilling (until after indece.) and national currencies	Common market	Uncoordinated monetary policy
CMA	1920 to present	Type II	Single and multiple	SA pound and rand (until after indece.) and national currencies	Customs union	Still exists
EMU	1999 to present	Type III	Single	euro	Common market	Still exists

The Euro Area model, which has become a point of reference for discussions on proposed monetary unions (including the WAMZ), belongs to the *Type III* category. This

category is the focus of this study. The other categories are pseudo-monetary unions because the cost of withdrawal, arguably, is not as grave as in the case of the full monetary union. Furthermore, for most dollarizers and currency board operators, their motive is to insulate themselves from currency crisis and adopt a better monetary policy than is administered by itself³⁴. By so doing, they replace domestic monetary policy with a foreign one, rather than a common monetary policy.

A full monetary union (*Type III*) is one whereby countries consent to abandon their respective currencies, create a new central bank which is mandated to formulate a common monetary policy on behalf of all the countries and issue a hitherto non-existent currency to serve as legal tender within the region. The process primarily involves the following:

- a) a commitment to irrevocably fix the exchange rate amongst the member countries
- b) the creation of a supranational central bank which will issue the regional currency; and
- c) the pooling of independent monetary policies leading to the formulation of a common monetary policy for all the countries.

The main drawback, however, is the loss of independent monetary policy since countries consent to integrate on this score to foster the achievement of their collective monetary goals. If countries experience differential shocks, misalignments in certain countries could be amplified rather than resolved if policies do not go directly to rectify them. Again, the loss of monetary policy independence also leads to the loss of seigniorage profits. Moreover, monetary unions limit fiscal policy maneuverings through the imposition of debt and budget deficit caps. This could pose a challenge to political leaders in democratic dispensations which might have assumed authority to better the lot of the electorate through increased spending. In addition, in

³⁴ Kenen and Meade (2008).

times of natural disasters, expenditure caps could determine the extent to which the government could respond, (Eichengreen, 1994).

The main advantage that countries could derive from joining a monetary union is the reduction in transaction costs which comes as a result of the use of a single currency. It also enhances financial exchange, (Barro, 2004). Mundell, in his seminal article, argued that the sharing of international risk could serve as a strong appeal for countries to join monetary unions. That is to say, the pooling of foreign exchange reserves makes it possible for part of those resources to be used to ease the burden of a struggling member, who might not have been privileged to receive such assistance if it stood alone. Furthermore, countries whose currencies are unstable could be migrating onto a more stable currency to facilitate trade. Again, because of the threat of spillover effects of badly implemented policies in member countries, there is the tendency for countries in a monetary union to monitor the expenditure patterns and the general conduct of fiscal policy of member countries to forestall the group being burdened with the consequences of such policies. This will not just be in the interest of such individual countries but the region as a whole.

Central bank independence is paramount in the quest to achieve fiscal discipline. Monetary unions more or less impose central bank independence on countries which would not have adhered to the need to ensure that their central banks are independent from interference by the fiscal authority. In effect, governments are forced to exercise fiscal prudence knowing very well that the central bank will not bail them out in the event that they overspend³⁵.

However, the accrual of these advantages to any group of countries in a monetary union largely depends on:

³⁵ A case in point is when the European Central Bank refused to grant Greece a complete bailout in 2010 after it had failed to cap expenditure, thus, plunging it into debt.

- a) the extent of intra-regional trade
- b) the similarities of the shocks
- c) the degree of labour mobility; and
- d) the availability of fiscal transfers to distressed economies in the union.

Discussions on the advisability of whether a group of countries would be better off joining a monetary union than operating any of the exchange rate regimes already discussed is usually done within the context of the OCA theory.

2.1.4 The Optimum Currency Areas Paradigm

The OCA theory has ignited deliberations on monetary unions as well as other forms of international arrangements meant to tackle the exchange rate problem. Indeed, the theory, which was famously propounded by Robert Mundell (1961), has been touted as the springboard upon which the EMU took off. The theory seeks to find answers to the following questions:

- a) is country x an optimum currency area?
- b) is the use of a single currency in x an optimal choice or would individual parts (regions, provinces, prefectures, etc.) of x be better off with individual currencies? and
- c) would x be better off if it joined a larger currency area (with a common currency) rather than using its own independent currency?

The concept has been defined differently by various authors. Mundell (1961) defined a currency area as “a domain within which exchange rates are fixed.” Frankel (2004) defines an OCA as “a region that is neither so small and open that it would be better off pegging its currency to a neighbour, nor so large that it would be better-off splitting into sub-regions with different currencies.” Mongelli (2002) defines it as “the optimal geographic domain of a single

currency, or of several currencies, whose exchange rates are irrevocably pegged and might be unified.”

As espoused by Mundell (1961), and later expanded by McKinnon (1963) and Kenen (1969), the OCA paradigm is a benchmark for assessing whether it is economically prudent for a group of countries to form a monetary union. In his ground-breaking article of 1961 called “The Theory of Optimum Currency Areas”, Mundell sought to underline the conditions under which a monetary union would be feasible at a time when there were growing debates about the feasibility of a monetary union for Europe. There are two Mundell theories – one in favour of monetary unions and one against it. The first one, which is based on stationary expectations, seems to take a stance against it.

As opined by McKinnon (2002), “The doubters who opposed EMU used arguments drawn from Mundell’s work. This is because the article seems to come down against a common monetary policy – and seems to argue in favour of making currency areas smaller rather than larger.” McKinnon attributes this first thought to the dominant Keynesian ideology that national monetary and fiscal policies could successfully fine-tune aggregate demand to offset private sector shocks on the supply or demand sides, which held sway in the aftermath of World War II. In specific reference to Europe, Mundell posits that labour mobility was restricted to fairly small national, or even regional, domains, as in Western Europe. Armed with the stationary expectations theory and the reality of low labour mobility in Western Europe and developing economies, Mundell advanced his arguments in favour of a flexible exchange rate regime as follows:

“Consider a simple model of two entities (regions or countries), initially in full employment and balance of payments equilibrium, and see what happens when

the equilibrium is disturbed by a shift in demand from the goods in entity B to the goods in entity A. Assume that money wages and prices cannot be reduced in the short-run without causing unemployment, and that monetary authorities act to prevent inflation... The existence of more than one (optimum) currency area in the world implies variable exchange rates..... If demand shifts from the products of country B to the products of country A, a depreciation by country B or an appreciation by country A would correct the external imbalance and also relieve unemployment in country B and restrain inflation in country A. This is the most favourable case for flexible exchange rates based on national currencies,” (Mundell, 1961. pp.510-11).

Furthermore, Mundell's 1961 article concluded that a one-size-fits-all monetary policy will not be appropriate when labour markets are somewhat segmented internationally and the composition of output varies from one country to the next, leading them to experience terms of trade shocks differentially. Thus, on this score, Mundell is interpreted as arguing in favour of having an independent national monetary policy with exchange rate flexibility as being the most efficient way to deal with asymmetric shocks, much in line with the Keynesian ideology of the times.

The second argument, as espoused by McKinnon (2002), which is in support of monetary unions (and captured in Mundell's International Risk Sharing Argument in his 1973 paper), has gained much prominence. This argument is based on the fact that the impact of international risk on any one country, which is a member of a currency area, dissipates (or at worst, reduces) because of the collective insurance provided by the group. In furtherance of this argument, Mundell, while examining a two country case, opined that:

“A harvest failure, strikes, or war, in one of the countries causes a loss of real income, but the use of a common currency (or foreign exchange reserves) allows the country to run down its currency holdings and cushion the impact of the loss, drawing on the resources of the other country until the cost of the adjustment has been efficiently spread over the future. If, on the other hand, the two countries use separate monies with flexible exchange rates, the whole loss has to be borne alone; the common currency cannot serve as a shock absorber for the nation as a whole except insofar as the dumping of inconvertible currencies on foreign markets attracts a speculative capital inflow in favour of the depreciating currency,” (Mundell, 1973, p.115).

Mundell underscored that countries would constitute an OCA if labour was fluid. In this sense, if there was some disequilibrium in one part of a region, labour there would migrate to some other part of the same region to ease demand pressures and unemployment in the first part. This is discussed in more detail below.

Mundell’s OCA: The East and West Economies Illustration

To illustrate his OCA theorem, Mundell (1961) considered two regions, East and West, each having its own currency and independent central bank but having an agreement to fix the exchange rate between their currencies. Furthermore, he made these assumptions:

- a) the two countries are at full employment
- b) their bilateral trade is balanced; and
- c) there are no capital movements between them.

Having specified the assumptions, he introduced a demand shock to aid his analyses.

A Switch in Demand from Western to Eastern Goods

He assumed an autonomous increase in the demand for Eastern goods emanating from a switch in the demand for Western goods to domestic goods by Eastern citizens. This development has both domestic and external implications for the East. Domestically, it has the tendency to elicit an increase in labour demand in the East since more workers will be needed to boost output in response to the increase in demand. Furthermore, this would mean that the East will run an unsustainable trade surplus with the West due to the assumptions of capital immobility and balanced trade. Externally, the demand disturbance would reduce the demand for labour in the West owing to the drop in the demand for its goods.

One would think that monetary policy, initiated in either the East or the West, could rectify the problem. A tighter monetary policy in the East could stabilize the economy, but it could exacerbate the unemployment situation in the West by leading to a further fall in demand by Easterners for Western goods. What if the West relaxes its monetary policy? Again, this could serve to stabilize the domestic economy but not restore trade balance. Since the exchange rate is fixed between them, it cannot serve as an automatic adjustment factor to facilitate the re-establishment of trade equilibrium between the two countries. Mundell points to two adjustment mechanisms.

Mundell posits that perfectly flexible wage rates in both countries could by themselves work to resolve the trade disequilibrium. The increase in demand for labour in the East consequent to the exogenous demand increase will push up the wage rate there under flexible wage circumstances³⁶. As the cost of production – induced by wage hikes – increases, so will the price of goods. At the opposite end, the drop in labour demand will cause a decline in wage rates

³⁶ Because of the assumption of full employment, demand pressure on labour will naturally lead to increased labour costs.

leading to a fall in prices in the West. With a fixed exchange rate in operation, residents of both countries will be inclined to buy more Western goods than Eastern goods until a time that Eastern wages equilibrate Western wages to counteract the initial demand disturbance.

Secondly, if labour is mobile between the two countries, the redundant labour in the West could migrate to the East to neutralize the labour supply-demand problem. This excess labour will neutralize the threat of wage rate increases in the East while at the same time causing the existence of a temporal *labour deficit* in the West, which will in turn bid up wage rates in the West. In effect, the unemployment which was created by the demand switch would have been resolved through the labour mobility mechanism without monetary policy adjustments. Kenen and Meade (2008), in throwing more light on the situation, looked at a resolution from the trade-balance perspective. They argue that the migration of Western labour to the East would mean that a portion of Western imports would have been *domesticated* since the consumers would be consuming Eastern goods while living in the East. On the other hand, their demand for Western goods is *internationalized* since they would be consuming such goods in the East. So in effect, not only does the migrating labour resolve the issue of unemployment, but they reduce Western demand for Eastern goods while at the same time, increasing Eastern imports of Western goods³⁷.

In Mundell's perspective, once labour is freely mobile such that unemployment can be averted under every circumstance, a group of countries constitute an optimum currency area and can thus form a monetary union³⁸. In essence, the presence of labour mobility in a region could be enough justification for the countries in that region to permanently fix their exchange rates

³⁷ The trade argument may not be enough on its own to tackle disequilibrium. The assumption is that the demand of the migrating labour is equal to the initial demand disturbance and that they would continue to demand equal amounts (if not more) of what they used to consume back home.

³⁸ Mundell's attention at the time was on output stabilization and employment rather than price stability or financial stability.

since labour mobility could curb unemployment, thus, reducing the need for exchange rate maneuvers to achieve the same goal.

Critique of the Labour Mobility Argument

A number of authors have criticized this model where labour plays the role of an automatic adjustment factor. Some authors have shown that even though migration is capable of correcting disturbances, it does so gradually even in single nation states³⁹. Other studies have pointed to such migration inhibiting factors as language and cultural barriers and the huge costs of migration as reasons why it would not be that easy for the migration mechanism to come into effect that quickly⁴⁰. Kenen (1969, p.113) puts it thus:

“We do not have perfect mobility because perfect mobility implies perfect occupational mobility and the latter does not prevail. The labour force is not so homogeneous that it is possible to talk about perfect mobility, unless that region is a single-product region.”

Post-Mundell OCA

The Evolution Stage

Since Mundell’s seminal work on the OCA paradigm, a number of contributions have been made to fine-tune the original concept. McKinnon (1963), Kenen (1969) and others have added new and interesting dimensions that have broadened the scope of the original idea. Based on the original thought and some of these new additions, Frankel (2004) – who argues that open and small-sized economies that are highly integrated with each other with respect to trade and

³⁹ Blanchard and Katz (1992, p.3), in a study of the United States came to a similar conclusion.

⁴⁰ Eichengreen (1994).

other economic relationships are likely to constitute an OCA – outlines the criteria for OCA as follows:

- a) openness
- b) labour mobility
- c) fiscal cushions or fiscal federalism
- d) symmetry; and
- e) political willingness to accept neighbours' policies

The succeeding paragraphs give a detailed account of some of the new thoughts on the subject matter.

The Degree of Openness and Regional Interdependence

The more open an economy is, the more it has to deal with a variety of currencies. This has an attendant increase in transaction costs. In a situation whereby the country trades extensively with other countries in a geographical area, sharing a common currency with them can facilitate a reduction in transaction costs. McKinnon (1963), the proponent of this criterion, argues that flexible exchange rates are associated more with closed economies than with open⁴¹ ones and that open economies are more likely to opt for a fixed exchange rate than a flexible one. He argued that high intra-regional trade, for example, will result in a reduction of transaction costs associated with the use of a common currency while getting the countries' shocks to co-move.

⁴¹ He defined openness as the ratio of tradables to non-tradables.

The Degree of Diversification

Arguing from the shock asymmetry perspective, Kenen (1969) posited that economic diversification can help insulate economies from the effects of demand shocks to their export commodities, as opposed to the pursuit of the conventional comparative advantage policy which leads to specialization. In the face of diversification, countries will be less affected by shocks to particular commodities, leading to the removal or minimization of the shock asymmetry hurdle for countries which seek to form a monetary union.

“A country that engages in a number of activities is also apt to export a wide range of products. Each individual export may be subject to disturbances, whether due to changes in external demand or in technology. But if those disturbances are independent, consequent on variations in the composition of expenditure or output, rather than massive macroeconomic swings affecting the entire export array, the law of large numbers will come into play. At any point in time, a country can expect to suffer significant reversals in export performance, but also enjoy significant successes... From the standpoint of external balance, taken by itself, economic diversification, reflected in export diversification, serves, ex ante, to forestall the need for frequent changes in the terms of trade and therefore, for frequent changes in national exchange rates,” (Kenen 1969, p.49).

Kenen argues that the threat of terms of trade shock changes are minimized the more diversified an economy is. All in all, his argument hinges on the assertion that:

“positive changes with respect to some exports will be offset by negative changes with respect to others; as demand for some increases, the demand for others falls. The more diversified are export products, the greater will be the offsetting

mechanism... a well diversified national economy will not have to undergo changes in its terms of trade as often as a single product national economy,”
(Kenen 1969, p.49).

Kenen’s product diversification principle, which to some extent is related to the openness proposition by McKinnon (1963), also endorses the use of fixed exchange rates by economies that fall within this category. As he puts it, fixed rates are “most appropriate – or least inappropriate – to well-diversified economies.” He argues that specialization leads to nation-specific shocks, a situation which makes the application of a uniform monetary prescription ineffectual, while diversification allows for the shifting of resources from one sector to another to ease domestic disturbances.

However, as much as product diversification can help moderate the effects of shocks, it could have an adverse impact on intra-regional trade. This line of argument, which I have christened the *product complementarity principle*, holds that the areas of product diversification must be thoroughly considered, since the engagement in the production of competitive commodities will reduce the impact of the implicit gains from the usage of a single currency in a region, which is intra-regional trade enhancement. If product diversification leads to the production of substitutable goods within a region, the countries will drift from one another with regards to trade. But if the countries diversify their economies by producing complimentary goods, it could spur intra-regional trade since intra-industrial linkages will be enhanced. In effect, it is not just the quantum of trade that is important but also the nature of trade. In this regard, intra-industry rather than inter-industry trade will facilitate symmetric shocks. In the event that regional trade is low, savings on transaction costs will be insignificant, thus, nullifying one of the primary incentives for permanently fixing the exchange rate within a region.

Policy-based Criterion

Since the OCA theory highlights potential trade-offs in permanently fixing the exchange rate between a group of countries, it has been suggested that the countries involved should exhibit similarities in key economic indicators such as inflation⁴². For instance, Fleming (1971) posits that terms of trade tend to be fairly stable when inflation rates between countries are similar over time. Given this condition, the likelihood of adjusting the nominal exchange rate for re-equilibration purposes becomes minimal and as a result countries will not face much difficulty if they were to fix the exchange rate between them.

Another line of argument relating to policies is what has become known as *fiscal federalism*. This argument purports that if there is a supra-national entity which facilitates the transfer of funds (an insurance) from one area of a region to another area which has been affected by an adverse economic shock, the countries within the region need not carry out nominal exchange rate adjustments, since the fiscal transfer would have taken care of the adjustment process by compensating the region most affected, as espoused by Mundell (1973).

The Political Dimension

In political circles, it is said that the minority will have their say but the majority will have their way. The same applies to the decision to join a monetary union. The economists will have their say but the politicians will have their way. Politics plays a very critical role in the decision to join a monetary union⁴³. Ingram (1969) posits that:

⁴² Haberler (1970) argues that the similarity of policy attitudes, rather than the characteristics of the economy, creates the conditions for a successful currency area. Other authors like Vaubel (1990) have suggested that the real exchange rate is a better criterion than the labour mobility, diversification and openness criteria.

⁴³ Mintz (1970) sees the political will to integrate as the single most important condition of adopting a common currency.

“I do not think the optimum size of a currency area can be discovered by looking for real economic determinants of it, such as degree of labour mobility or homogeneity of output, although these factors may certainly affect the speed and ease of adjustment. I think the efficacy of a currency area depends on policy positions taken by governments and on the firmness of their commitment to them ...”

Politics shape the realization of currency areas through the coordination of policies *ex post* and the willingness to give up policy autonomy *ex ante*. Without this, no matter how economically viable a region is, there can never be any form of integration. Eichengreen (1994) identifies the following as some of the reasons why politics plays such an important role in the decision to form a monetary union.

- a) *Money as a Symbol of Sovereignty*: Money is seen as a symbol of sovereignty. This is the reason why most countries issue their own currencies after they have gained independence from their colonial masters. Aside from all the reasons that have been adduced for Britain’s decision to opt out of the Euro Zone, one notable reason was its unwillingness to let go of the pound sterling.
- b) *The Politics of Seigniorage*: Sovereignty bestows the right to resist aggression from abroad and seigniorage affords governments the clout to raise extra revenue when economic upheavals or natural disasters make defense from aggression impossible. Printing of money helps, at least in the short-term, to fund government programmes and to address some difficulties at home. However, joining a monetary union is one way of ensuring regional peace and stability, especially if there are no escape clauses.

- c) *Money as a Political Bargaining Chip*: A country may join a monetary union not just because of economic reasons, but also political. Germany has gained a voice by joining the Euro Area, after having had to sign up to the euro even though it was doing so well on its own.
- d) *Money and the Political Economy of Protection*: Countries that value open markets will opt for monetary unions in order to escape from the temptation of altering the exchange rate to protect local industries. The same argument could be used as the reason why protectionist governments may not join monetary unions.
- e) *The Politics of Monetary Accountability*: Politicians must be accountable to the citizenry. The loss of monetary independence may not be in the interest of any political party since regional monetary institutions are not directly accountable to local political institutions (such as parliament) as is the case when there is an independent central bank. Countries which hold accountability in high esteem may decline to join monetary unions because of this.
- f) *Politics and the Fiscal Concomitants of Monetary Union*: OCA identifies fiscal federalism as a good indicator for monetary union. However, governments are reluctant to relinquish their revenue and spending prerogatives. The decision on whether or not to cede some fiscal space to a monetary union is also a political one. That is why political influence cannot be ruled out from discussions of this nature.

In view of the above, politicians make a great deal of sacrifice when they decide to give up their independent currencies and monetary autonomy to join a monetary union. So out of necessity, politics should be one of the OCA criteria.

Recent Developments in the OCA Theory

Recently, the OCA theory has undergone some form of revision, with many authors questioning the basis of the traditional criteria and others adding one or two dimensions to the existing literature. Mongelli (2002) argues that the recent revision of the OCA theory leads to a “reconsideration of the effective costs and benefits from monetary integration.” The recent discussions have moved to expectation formation, credibility of the monetary authority and time inconsistency⁴⁴. A much more recent addition is the endogeneity of the OCA criteria which holds that the criteria do not necessarily have to be achieved *ex ante* but that they can even be achieved after the monetary union has been instituted. Some of the recent developments are discussed below.

The ‘New’ Phillips Curve and the Long-run Ineffectiveness of Monetary Policy

The ‘old’ OCA theory identifies the loss of independent monetary policy as the number one cost of monetary unification, since governments can no longer fine-tune shocks (and by extension, unemployment) by using monetary policy. That is to say, in periods of high unemployment, the monetary authority would be inclined to embark on an expansionary monetary policy to elicit job creation. This policy, however, could induce inflation. However, post-1960 empirical studies on the inflation-unemployment nexus suggest that the initial view of an inverse relationship between the two (inflation and unemployment), as captured by the Phillips Curve, does not hold perpetually. This has come about because labour is thought to factor in expected inflation when undertaking wage negotiations. This notion of rational, rather than adaptive expectations, has led to the transformation of the original Phillips Curve into the Augmented Phillips Curve and the Natural Rate of Unemployment (NRU). At the NRU,

⁴⁴ Tavlas (1993) and De Grauwe (2007).

monetary policies only have an impact on inflation rather than employment⁴⁵. Proponents of this argument posit that, if this is the case, then the loss of monetary policy autonomy is not as significant as it was thought to be since it has no impact on employment in the long-run. This view on the ineffectiveness of monetary policy in the long-run has been criticized by various authors who argue that money is not always neutral⁴⁶.

To add to this, Masson and Pattillo (2005) argue that some countries misapply monetary policies. Instead of using them to fine-tune disturbances, they inadvertently worsen them, so it would not be out of place to hand them to a supra-national body.

Credibility of the Monetary Authority

Some countries have struggled to gain public confidence whenever they announce low inflation strategies, owing to a history of time inconsistency on the policy. One way of dealing with this problem is through *borrowed credibility*, where a country which has credibility issues pegs its exchange rate to a low inflation country or a monetary union which exudes credibility. Bofinger (1994, p.21) puts it this way:

“The surrender of all national policy responsibilities to a supra-national central bank system is the most obvious signal that a country is no longer attempting to make use of surprise inflation. Of course, this requires that the central bank which is in charge of the common currency has a higher credibility than the national bank.”

Eichengreen (1994) also sees credibility as a very significant element in a country’s ability to effectively implement its policies.

⁴⁵ Artis (1991) argues that at the NRU, policy makers only have a choice of inflation rather than unemployment.

⁴⁶ Tavlas (1993).

Effectiveness of Exchange Rate Adjustments

Over the years, some researchers have questioned the efficacy of the nominal exchange rate in fostering external equilibrium adjustments⁴⁷. They argue that if the nominal exchange rate is not an effective tool for addressing macroeconomic misalignments, then losing it to a regional body would cost virtually nothing.

Endogeneity of the OCA Paradigm

The endogeneity of OCA has become a topical issue in discussions on monetary unions. Studies by the European Commission (1990), Frankel and Rose (1998, 2002), Engel and Rose (2002), Rose (2000) and many others purport to find that the OCA criteria can be achieved *ex post* and as a result too much emphasis should not be laid on historical data in assessing the eligibility of a group of countries to form a monetary union. Indeed, in Frankel and Rose's (1998) study, they established that business cycle synchronization could deepen after the countries begin to abide by the same monetary rules and implement enhanced fiscal policy coordination. However, some authors are of the view that integration would rather lead to asymmetric shocks rather than correlation of shocks. This is based on the argument that integration could lead to specialization by countries in order to exploit fields where they have comparative advantages⁴⁸. It must, however, be underscored that specialization might not necessarily lead to asymmetric shocks as long as it takes place in complementary industries which have the potential to boost regional intra-industrial trade.

⁴⁷ Krugman (1991b), De Grauwe (2007), Tavlas (1993), among others.

⁴⁸ Krugman (1993) and Rauch (1994).

2.2 The EMU: The Contemporary Blue-print for Monetary Unification

This section covers the evolution of the Economic and Monetary Union (EMU) of Europe from the Werner Plan through to the issuance of the euro currency in 2002. The EMU model, though not the first of its kind, has become the bedrock of all discussions related to exchange rate unions, monetary unions and the OCA⁴⁹. The EMU had been on the drawing board since 1970, and even though not all the tenets of the blueprint have been realized, the issuance of euro notes and coins in 2002 was a watershed event. Pre-EMU discussions are broken down into three parts as follows:

- a) the Werner Plan.
- b) the European Monetary System; and
- c) the Delors Report and the Maastricht Treaty.

2.2.1 The Werner Plan

The exchange rate problems that occurred in the late 1960s led countries, particularly in Europe, to consider alternative ways of stabilizing their currencies. At the time, the Vietnam war had damaged the United States economy to such an extent that the dollar was barely able to perform its role as the anchor for the international monetary system under the aegis of the Bretton Woods institutions. This led to the devaluation of the French franc and the revaluation of the German mark, which threatened the stability of the other currencies in the European Common Market and the prices set up under the Common Agricultural Policy (CAP), thus,

⁴⁹ EMU is the “most spectacular and ambitious monetary union of all times”, (Verdun, 2007). Verdun argues that the scale and magnitude of previous monetary unions in Europe were not as far reaching as the EMU because they barely had a single monetary policy and central bank.

calling for greater coordination of economic policies and closer monetary cooperation, (Boiscuvier and Steinherr 2004).

At a summit of the European Communities at The Hague, The Netherlands, in 1969, the goal of economic and monetary union was tabled and discussed after which a committee, with Pierre Werner (then Prime Minister of Luxembourg) as its chairman, was constituted to look into the modalities of achieving it by 1980⁵⁰. Subsequently, the Committee submitted an interim report in June 1970 and the final one later in October of the same year, spelling out a three-stage plan to achieving full economic and monetary union in ten years as follows:

- a) coordination of monetary and fiscal policies
- b) the creation of institutions to monitor countries' performance; and
- c) the irreversible fixing of exchange rates (adoption of a new single currency) and the liberalization of the capital markets.

The demise of the Bretton Woods system, which was precipitated by the departure of West Germany in May 1971 and the Nixon shock of August 1971, made greater European monetary cooperation all the more imperative⁵¹. This led to the creation of a narrow target zone, which fixed the bilateral exchange rates of the six countries while permitting them to fluctuate within a margin of ± 2.25 percent. This band would also move within a ± 4.5 percent margin of the exchange rate with the dollar. This was called the “snake in the tunnel”, with the former arrangement referred to as the *snake* and the latter the *tunnel*⁵².

⁵⁰ The meeting was attended by the six members at the time, namely France, Germany, Italy and the Benelux countries (Belgium, The Netherlands and Luxembourg).

⁵¹ The Nixon shock refers to the period of August 1971 when Richard Nixon, the then President of the United States, stopped the direct convertibility of the dollar to gold, the framework around which the whole system was built.

⁵² The snake in the tunnel was created in April 1972.

The snake suffered a major setback during the first oil shock of 1973 and the rippling effects of the Nixon shock as well as the inclusion of three new members in the arrangement⁵³. The situation was also not helped by the divergences in policies of the countries involved, thus, causing France, Ireland, Italy and the United Kingdom to exceed the defined parameters of the band. A new strategy was therefore needed to shore up the gains of the snake. This led to the creation of the European Monetary System (EMS).

2.2.2 The European Monetary System

In an effort to maintain discipline in exchange rate management within the region, Germany and France proposed the establishment of the EMS, first in April and later in July of 1978, with the following as its main components:

- i) the European Currency Unit (ECU)
- ii) the Exchange Rate Mechanism (ERM); and
- iii) financial support.

The EMS was akin to the *snake* but had two distinguishing features – the ECU and financial support.

“First was the creation of the European Currency Unit (ECU) as the centre of the system against which divergence of the exchange rate was to be measured... Second, the EMS was to be supported by a European Monetary Fund (EMF), which was to absorb short-term financing arrangements operating within the snake...,” (El-Agraa, 2007)

⁵³ Denmark, Ireland and The United Kingdom joined the snake in May 1972, (Boiscuvier and Steinherr, 2004).

The realization of this goal in March 1979 would become another stepping stone to the achievement of what has become a model for the study of monetary unions – the Euro Area.

The European Currency Unit

The ECU became operational in 1979. It was a basket of the European Community member states' currencies (those within and without the ERM) which was used as the reference currency or denominator of the EMS, and for that matter, the ERM⁵⁴. The weights of the respective currencies were derived based on the economic importance of the countries involved which was determined by using one or more of each country's share of:

- a) the EC's total GDP
- b) intra-Community trade; and
- c) the EMS financial support system.

The individual currencies and their exchange rates to the ECU were calculated as shown in Table 2.2.

⁵⁴ The ECU initially included 9 currencies: the Belgian franc, Luxembourg franc, German mark, Dutch guilder, British pound, Italian lira, French franc, Danish krone and the Irish punt. The Greek drachma was added later on.

Table 2.2 Calculation of ECU Rates on December 1, 1983

National currency component (a)	12.1.1983 exchange rate against the US\$ (b)	Equivalent in US\$ of national currency component (c) = (a)/(b)	National currency rate of ECU (d) = US\$ total X (b)
0.828 German Mark	2.3528	0.3519211	2.29224
1.15 French Franc	6.6685	0.1724526	6.49686
0.0885 British Pound	1.58	0.1398300	0.616621
109 Italian Lira	1350.25	0.0807258	1315.50
0.286 Dutch Guilder	2.594	0.1102544	2.52723
3.66 Belgian Franc	46.22	0.0791865	45.0304
0.14 Luxembourg Frank	46.22	0.00302899	45.0304
0.217 Danish Krone	8.2950	0.0261603	8.08150
0.00759 Irish Punt	1.41	0.0107019	0.690966
Dollar rate of ECU: 0.9742616			
NOTE: The dollar exchange rate for the pound sterling and the Irish punt is the number of dollars per currency unit rather than the number of currency units per dollar. Column (c) is therefore found for each of these two currencies by multiplying the value in column (a) by that in column (b); and column (d) by dividing the dollar equivalent of the ECU, (c), by the rate in column (b).			

Source: European Community (1983)

The Exchange Rate Mechanism

The ERM, based on the concept of pegged but adjustable exchange rates, had the ECU as its central rate with allowable drifts of ± 2.25 percent (± 6 percent for Italy until 1990 and for the later entrants – Portugal, Spain and the United Kingdom)⁵⁵. Countries were mandated to intervene when 75 percent of the allowed exchange rate oscillation of ± 2.25 percent (± 6 percent

⁵⁵ Boiscuvier and Steinherr (2004), El-Agraa (2007).

for Italy) had been reached. Despite this, a few realignments were made to the parities until January 1987 and the rates would remain the same for quite some time. However, following incessant speculative attacks on the Italian lira and subsequently the British pound, the Spanish peseta and the Portuguese escudo, the ERM bands were extended to ± 15 percent in August 1993⁵⁶.

Financial Support

Countries were enjoined to assist any country whose currency reached its lower fluctuation limit against another EMS currency through the Very Short-term Facility, the Short-term Monetary Support (STMS) and the Medium Term Financial Assistance (MTFA). This was meant to dampen the effects of speculative attacks and to ensure the stability of the EMS. The Very Short-term Facility made it possible for the monetary authority of a weak currency to borrow any needed amount of the currency against which its currency depreciated from the issuing central bank. “The STMS was based on a system of quotas which determined each EEC central bank’s borrowing entitlement (debtor quota) and financing obligations (creditor quota)”, (EC, 1983). The MTFA, on the other hand, provided medium term credits to member states facing balance of payments difficulties.

2.2.3 The Delors Report and the Maastricht Treaty

Efforts to achieve the EMU took a step further when in June 1988, the Hanover European Council set up a committee headed by Jacques Delors (then president of the European Commission) to come up with a proposal outlining the modalities for realizing the EMU

⁵⁶ Eichengreen and Wyplosz (1993) and Verdun (2007). Refer to Eichengreen (1994) for more on the exchange rate crisis.

objective. The Report, submitted in April 1989, specified three stages leading up to the creation of the monetary union: the diagnostic stage, the convergence stage and the implementation of the monetary union, (Boiscuvier and Steinherr, 2004). This was given a boost when the Treaty of the European Union, popularly known as the Maastricht Treaty, was signed on February 7, 1992. The Treaty is credited with creating the euro and the pillar structure of the European Union.

The diagnostic stage, which ran from 1990 to 1993, witnessed the removal of capital controls (by July 1, 1990), the reduction of international inflation and interest rate differentials, and increased stability of intra-European exchange rates. The second stage (1994-1998) was designed to bring about the achievement of economic convergence. It was characterized by the further convergence of national economic policies and the creation of a temporary entity, the European Monetary Institute (EMI), in 1994, to coordinate member countries' monetary policies and to study the modalities of moving to a monetary union, (El-Agraa, 2007). If all the conditions in the second stage were met, they would then usher in the third stage – the monetary union. The Delors Report had initially suggested that the third stage should begin in 1996, but by then only France and Luxembourg had met all the convergence criteria, so it had to be postponed, (Boiscuvier and Steinherr, 2004). The EMI metamorphosed into the European Central Bank (ECB) on June 1, 1998, in preparation for the commencement of the third stage.

The conditions that participating countries had to meet in order to commence the third stage included interest rate stability, price stability, budget balance and exchange rate stability. It was important for countries to hold the variability of their exchange rates within the normal EMS fluctuation bands without severe tensions for two years prior to the decision to commence the monetary union. So in effect, the Treaty envisaged a period of two years (or more) whereby there was no capital controls, exchange rates were pegged and the potential for independent national

policies remained, (Eichengreen, 1994). Having generally satisfied the convergence criteria, the third stage commenced on January 1, 1999, with a single monetary policy for all the member countries, in addition to permanently fixing the conversion rates between the euro and the national currency units. Consequently, commercial banks conducted wholesale transactions and market operations in the euro from January 1, 1999, but it was not until January 1, 2002, that euro notes and coins were issued to the public. At this stage, the monetary union had become fully operational with a common central bank, a common monetary policy and a single currency.

2.3 Empirical Literature

There exists a whole gamut of literature concerning monetary unions and the OCA theory from studies conducted on the EU, ASEAN+3, NAFTA and certain regions in Africa. However, as noted earlier, studies on the WAMZ are very limited. This section reviews literature on the EU, ASEAN+3 and Africa.

Bayoumi and Eichengreen (1994) conducted a study on three regions – Western Europe, East Asia and the Americas – to establish their readiness and/or eligibility for monetary unification *a la* the OCA paradigm. The authors focused on the shock asymmetry aspect of the OCA theory by employing the Blanchard and Quah (1989) methodology⁵⁷ to delineate demand and supply shocks and consequently correlated, respectively, the demand and supply shocks of countries in each region to ascertain whether there were any co-movements of shocks (or otherwise) using the vector moving average (VMA) model below

$$X_t = A_0\varepsilon_t + A_1\varepsilon_{t-1} + A_2\varepsilon_{t-2} + A_3\varepsilon_{t-3} + \dots \quad (2.1)$$

⁵⁷ This methodology is discussed in more detail in chapter 4.

where X_t is a column vector comprising the natural log-differences of output (Δy_t) and prices (Δp_t), ε_t represents demand (ε_{dt}) and supply (ε_{st}) shocks which are uncorrelated and have unit variances [i.e. $Var(\varepsilon_t) = I$] and the A s represent impulse response functions.

This was done by using annual data on real GDP and GDP deflators spanning 1969-1989 for fifteen Western European (exclusive of Luxembourg and Greece), eleven Asian (excluding Brunei but inclusive of Australia and New Zealand) and thirteen countries in the Americas. They emphasized the relative importance of supply shocks because of their long-run impact on output and used them as a basis to demarcate the countries into OCA and non-OCA zones.

The study revealed three OCA areas in Asia based on the correlation of the supply shocks. The first group consisted of Japan, Korea and Taiwan, the second group consisted of Hong Kong, Indonesia, Malaysia and Singapore, while the third consisted of Taiwan and Thailand. The results established a negative and significant supply shocks correlation between Australia and New Zealand despite their trade and investment ties. However, no clear OCA pattern emerged for the Americas, with two of the eight negative correlations occurring in the NAFTA area – between the United States and Canada on one hand, and the United States and Mexico on the other – despite the increasing trade relations between the three. This shows that the nature of trade in the region does not facilitate common shocks. For Europe, the study established a plausible monetary union comprising Austria, Belgium, Denmark, France, Germany and The Netherlands since all but two (between France and The Netherlands and between France and Austria) of the supply shocks correlations were significant.

They went further to examine the sizes of the demand and supply shocks and the speed of adjustment for the three regions. They concluded that the average supply shocks of both Asia and Europe were similar, whereas the Americas' was twice as large. Asia's demand shocks were

found to be twice as large as Europe's, and the Americas' was seven times larger than Europe's (and three times larger than Asia's). They asserted that groups that were found eligible to form monetary unions experienced smaller underlying disturbances, a testament to the shocks correlation analysis. Asia had the fastest adjustment speed, followed by the Americas. In contrast, only about half of the long-run steady state was achieved by the second period in Europe.

Tang (2006) adopted Bayoumi and Eichengreen's (1994) methodology while studying about the eligibility of twelve Asian-Pacific economies to form a monetary union. He conducted a full sample (the period of study was 1960-2002) correlation of shocks as well as pre-financial crisis (1960-1996) shocks correlation. For the period preceding the financial crisis, he established positive and significant correlations between some ASEAN bloc members: Indonesia and Malaysia, Malaysia and Singapore and Singapore and Thailand. In the Far East Asian bloc, the correlations of Hong Kong and Taiwan as well as Japan and Taiwan were found to be positive and significant. The study also found that Australia, China, New Zealand and the Philippines did not have common shocks with one another or with the entire group of twelve economies.

To assess whether the East Asian financial crisis had any impact on shocks co-movement, the study proceeded to full sample correlations. At this point, many of the correlations were found to be positive and significant. He noted that the correlations of some of the countries that were most severely affected by the financial crisis, which were found to have asymmetric shocks with the rest of the countries in the 1960-1996 sample, had a turn-around and painted a clearer picture of a viable OCA. Indonesia, Malaysia, Singapore and Thailand were found to be eligible to form a monetary union. For the Far East bloc, he identified pairs (rather than regions) between Hong Kong and Korea, Hong Kong and Taiwan as well as Japan and Korea. But there were overlapping correlations between the two blocs. The study identified OCA clusters involving

Singapore, Hong Kong and Taiwan on one hand, and Hong Kong, Malaysia, Singapore and Thailand on the other hand. Once again, Australia, China and New Zealand had no significant correlations with any of the economies, but the Philippines had a positive and significant correlation with Thailand. The results indicated that a full-fledged Asian Monetary Union may not be a very good idea. He advised that an East Asian monetary union would be feasible if clusters, rather than the entire region, started it.

Masson and Pattillo (2005) conducted a study on the possibility of monetary unions in Africa. On the WAMZ, they acknowledged the strong political backing but argued that the differences in economic structures of the countries involved could expose them to asymmetric shocks, since of the five countries only Nigeria was an oil exporter, with the rest being oil importers. The authors, while admitting that informal trade in the region could be quite substantial, argued that formal trade in the region was low. Furthermore, they found that Nigeria's terms of trade shocks were quite large and different from the rest of the West African countries and went on to posit that Nigeria might be disruptive in any monetary union in West Africa.

On the viability of a wider monetary union in West Africa, that is all the fifteen countries, they concluded that the WAEMU was better integrated than the WAMZ and that creating a wider monetary union could end up hurting the WAEMU. They argued that France, and for that matter the EU, might fall short of guaranteeing the convertibility of a West African currency as it is doing for the CFA franc. They also touched on indicators like institutional quality and corruption and concluded that African countries performed poorly on those scores.

The authors were not oblivious of the theory of the endogeneity of OCA, which asserts that symmetric shocks and enhanced intra-regional trade can be achieved after countries have

formed a monetary union. However, while conceding that intra-regional trade within the WAEMU (an established monetary union) was higher than within the WAMZ, they asserted that the nature of West Africa's export structures might not make it possible for the endogeneity principle to apply. They also expressed pessimism about the ability of a supra-national body within the ECOWAS to serve as an "agency of restraint" against excessive government spending, since the power brokers within the WAEMU were able to circumvent the rules in the late 1980s and early 1990s.

They concluded by saying that a West African monetary union should be discouraged, owing to the large asymmetries of fiscal positions and export components coupled with weak trade linkages. But they asserted that the WAEMU is beneficial for the countries in the region.

Huang and Guo (2006) sought to ascertain whether East Asia could constitute an OCA by using nine economies from the region while using a group of nine European countries as a benchmark. The study, which was an extended version of Bayoumi and Eichengreen's (1994) model, categorized shocks into external, supply and demand shocks. It established positive and significant correlations for the external shocks in the region. They attributed this partly to the export-oriented strategy of the countries in the last three decades. They established strong, positive and significant supply shocks correlations for Hong Kong, Indonesia, Malaysia, Singapore and Thailand. No such correlations were found for China, Japan and the Philippines. In contrast, the results for Europe were far more encouraging, with almost all of the nine countries having positive and significant supply shock correlations with one another.

They concluded that Europe was better integrated than East Asia. But they suggested a modest attempt at monetary unification involving Hong Kong, Indonesia, Korea, Malaysia,

Singapore and Thailand since they exhibited significant and positive correlations of underlying disturbances and had relatively smaller underlying shock sizes.

In another study on East Asia, Ling (2001) established a plausible monetary union comprising Singapore and Malaysia, Japan and Korea as well as Taiwan and Hong Kong based on the correlation of supply shocks. He argued that the union between Hong Kong and Taiwan made economic but not political sense. On examining the variance decomposition results, the author posited that structural shocks affected output and price movements in the region in different ways, since in some cases supply shocks accounted for a greater percentage of the variations in output, while in other cases it was demand shocks. The same could be said for the variations in prices. He attributed this to underlying differences in the transmission mechanism and policy strategies of the economies.

Barro (2004), using Alesina *et al*'s (2002) model, analyzed price and output co-movements in his analysis of world currency areas using the United States dollar, the euro and the Japanese yen as potential anchor currencies. He employed historical data on prices and outputs on 138 countries from 1958 to 1997, and second order autoregressive processes for both prices and output as stated below:

$$\log\left(\frac{P_{it}}{P_{jt}}\right) = b_0 + b_1 \log\left(\frac{P_{i,t-1}}{P_{j,t-1}}\right) + b_1 \log\left(\frac{P_{i,t-2}}{P_{j,t-2}}\right) + \varepsilon_{tij} \quad (2.2)$$

$$\log\left(\frac{Y_{it}}{Y_{jt}}\right) = b_0 + b_1 \log\left(\frac{Y_{i,t-1}}{Y_{j,t-1}}\right) + b_1 \log\left(\frac{Y_{i,t-2}}{Y_{j,t-2}}\right) + \mu_{tij} \quad (2.3)$$

where ε_{tij} and μ_{tij} are the residual terms of the price and output equations respectively. P and Y represent price and output respectively and i and j represent two countries. The estimated residual terms measure the respective relative price and output that would not be predictable from the two prior values of relative prices and output.

The author sought to establish the countries that proposed client countries traded more with by calculating their trade-to-GDP ratios. The results were that a good portion of North and Latin America traded more with the United States, and Africa traded more with the EU (but a few were closely linked with the United States). In contrast, few countries had a trade share with Japan in excess of ten percent of their GDP. This was confirmed by the results of (2.3) which established that Euro Area members and Western Europe had higher output co-movements with the Euro Area and Africa generally had higher co-movements with the Euro Area. Japan's business cycles seemed to be somewhat less associated with the rest of the world. In Asia, Hong Kong, China and Singapore were found to be more closely associated with the United States than with Japan.

On price co-movements, generated by (2.2) above, it was found that Puerto Rico and Panama, which use the United States dollar, had the highest co-movements with the United States, followed by Canada. Euro members and Western European countries had a high degree of price co-movements with the Euro Area. Africa also had a higher price co-movement with the Euro Area than with the United States. The countries that were most closely related with Japan in terms of price co-movements lacked a clear geographic definition, according to the study results.

Overall, the study established that the patterns of trade and price and output co-movements suggested geographically connected areas that were linked to the United States dollar (North America and much of South America) and the Euro Zone (Europe and Africa). For Japan, at most, a small part of East Asia seemed to apply.

In another study, Lee *et al* (2004) assessed the eligibility of the ASEAN+3 to form a monetary union by employing the dynamic factor model to ascertain the sources of each country's business cycles, be it global, regional or country-specific. In addition to the ASEAN+3,

the authors collected annual data on the real GDPs of sixteen Western European countries over the period 1978-1999. The study employed the model below:

$$Y_{jt}^r = \alpha_{wj} W_t + \alpha_{rj} R_t^r + \varepsilon_{jt} \quad (2.4)$$

where ε_{jt} is the factor specific to country j , α_{wj} and α_{rj} are the impact coefficients on W_t (an unobservable component of world economic activity which is common to all the countries) and R_t^r (an unobservable component common to each country belonging to the same region) respectively. Y_{jt}^r is the measure of aggregate output at time t for country j belonging to region r . The three factors were assumed to follow a stationary univariate first order autoregressive process as follows:

$$W_t = \rho_w W_{t-1} + \epsilon_t^w \quad (2.5)$$

$$R_t^r = \rho_r R_{t-1}^r + \epsilon_{rt}^R \quad (2.6)$$

$$\varepsilon_{jt} = \rho_j \varepsilon_{jt-1} + \epsilon_{jt}^\varepsilon \quad (2.7)$$

where ϵ_t^w , ϵ_{rt}^R and $\epsilon_{jt}^\varepsilon$ are serially and contemporaneously uncorrelated error terms.

The results indicated that the East Asian countries exhibited more volatility than their European counterparts. For the full sample period, it was found that both Europe and Asia's volatilities were mostly accounted for by country-specific factors rather than regional factors, with that of Asia being more pronounced. They also found that the trend had changed for the 1991-1999 period where regional, rather than country-specific factors, accounted for most of the volatilities in both regions. Not only was this the case, but world factors had also gained much prominence in the face of a weakening domestic influence. While taking cognizance of the potential impact of the 1997 financial crisis on the increased influence of regional factors in explaining fluctuations in growth, the study asserted that many countries in Asia would qualify

to join a monetary union since they responded well to regional shocks in a way that is comparable to their European counterparts.

Zhang *et al* (2004) assessed the feasibility of East Asia for monetary unification using a three variable case (i.e. domestic output, real effective exchange rate and the domestic price level) of Bayoumi and Eichengreen's model using quarterly data spanning 1980Q1-2000Q3. The study found that supply shock correlations within the region had improved after the 1997 financial crisis and that Japan and the US did not have significant supply shocks with the countries in the region until after the crisis. Yet, the authors argued that Japan was not well integrated in the region. The authors also found that demand shocks were better correlated. Furthermore, the study found that East Asia's shocks were larger, on average, than those of Europe. However, the speed of adjustment was faster in East Asia than it was in Europe. They concluded that a region-wide monetary union would not be a good idea but argued that some members of the Asian Newly Industrialized Economies (NIEs) and ASEAN qualified to form one.

The above studies are largely *ex ante* OCA studies. However, there is the belief that the OCA criteria can be achieved after the countries begin to adhere to the same monetary rules, (Frankel and Rose, 1998). A study commissioned by the European Commission in 1990 concluded that the OCA criteria may be endogenous as the countries integrate. Since then, several studies have sought to establish *ex post* trade synchronization, price convergence, business cycles and shocks synchronization.

It has been argued that the use of a single currency facilitates economic integration with its attendant trade liberalization, thus, leading to increased reciprocal trade which in turn engenders business cycle correlation. Earlier studies by Rose (2000), Glick and Rose (2002) and

Engel and Rose (2002) all point to *ex post* trade enhancement in monetary unions. Studies conducted after the commencement of the EMU by Bun and Klaassen (2002) and Micco *et al* (2003) confirm this notion, albeit with far lesser impact coefficients. While Bun and Klaassen (2002) posit that Euro Area trade increased by 4 percent in the first year of the euro's use, Micco *et al* (2003) confirmed a range of 4-10 percent trade increment as a result of the use of a single currency in the Euro Area.

Engel and Rogers (2004) argued that price dispersion within the Euro Area narrowed in the run up to the EMU. In the same vein, De Grauwe and Mongelli (2005) argued that the Harmonised Index of Consumer Prices (HICP) inflation converged during the various stages preceding the EMU. These arguments, though pre-EMU, point to the possibility of price convergence after monetary unification, since they were achieved during a period when common monetary interests and targets were being pursued.

Masson and Pattillo (2005) and Gulde (2008) maintained that the two CFA zones (which are both monetary unions) performed better than the non-CFA countries in sub-Saharan Africa in terms of macroeconomic stabilization, even though the former found that GDP growth was higher in the non-CFA countries than in the CFA zone. Furthermore, intra-regional trade within the CFA zone is larger than within the WAMZ even though after more than sixty years of sharing a common currency, intra-regional trade within the WAEMU (which is about 12 percent), for example, is nowhere near that of the Euro Area before the euro notes and coins were issued.

2.4 Concluding Remarks

This chapter has reviewed the relevant literature bordering the OCA theory as well as the concept of monetary unions. Since monetary unions seek to deal with exchange rate risk by

perpetually fixing the exchange rate among countries, the study sought to gain a deeper understanding of the available exchange rate regimes. It also reviewed the OCA theory in light of the Mundellian and post-Mundellian additions. Most importantly, it has drawn a distinguishing line between two OCA view points – one that says that the criteria must be achieved before monetary unification and another that says that the criteria can be achieved after monetary unification.

Furthermore, the chapter discussed the EMU in much detail, from the Werner Report to the Maastricht Treaty, because of its stature in the comity of nations that seek to establish monetary unions. Finally, the chapter reviewed some empirical literature on the subject matter to guide the course of this study. This was carried out in the *ex ante* and *ex post* OCA lines of argument.

Chapter Three

The Antecedents of the West African Monetary Zone

3. Introduction

Having achieved political independence between the late 1950s and the late 1980s, a large majority of African countries set their sights on fortifying their national boundaries on all fronts – politically, socially and economically – as a way of weaning themselves from the West. This led to the adoption of all manner of political, social and economic thoughts of the times. Politically, there was the usual debate of whether to sign up to the Chinese-type communism, but to a greater extent, whether to adopt the Soviet-type socialism or Western democracy. Economically, there were the typical options of import-substitution industrialization (ISI) and trade liberalization, which despite being an economic decision had political underpinnings. Socially, citizens' lifestyles were supposed to be in consonance with the political and economic policies adopted by the government of the day for it to be successful.

Beyond these policy options, the heads of states of independent Africa sought to create a regional bloc that would facilitate the political and economic liberation of the rest of Africa. This, among other factors, led to the creation of the Organization of African Union (OAU), which metamorphosed into the African Union (AU) in 2002, in May 1963. Some of the countries, led by Ghana, advocated the creation of federation states, and others, led by Côte d'Ivoire, proposed a gradualist approach towards political integration beginning with economic integration. Since then, various initiatives towards greater integration have been proposed by the (O)AU and passed on to the sub-regional blocs, with some sub-regional blocs initiating some of such agreements themselves. One of such sub-regional blocs is the Economic Community of West African States (ECOWAS).

The West African sub-region has been under-performing on all fronts – politically, socially and economically – since independence. Corruption, political instability, institutional failures, droughts, low productivity and specialization in primary commodity exports have

conspired against the economic forward march of the sub-region. Years of economic underachievement necessitated the IMF and World Bank to step in to propose some austerity measures towards arresting the below par performances. For some time, these measures seemed to be on course, with countries like Ghana and Uganda (in East Africa) touted as IMF success stories. But underneath the seeming macroeconomic stability lay a fragmented microeconomy which did not augur well for the agriculture sector and indigenous industries, especially manufacturing, leading to the collapse of many of such industries. Governments, in order to meet the attached conditionalities of the World Bank/IMF assistance, had to redeploy some public sector workers and privatize some state owned enterprises (SOEs). However, for the private sector, retrenchment of workers came on the back of worsening economic conditions due to its heavy dependence on the public sector, which had been made to cut down on expenditure, for contracts.

The development pattern of West African countries is largely symmetric. In light of this, it was only a matter of time that they would realize the need to operationalize age-long economic and trade agreements which had been left to gather dust. In ECOWAS, there was a drive towards trade cooperation through agreements to remove tariff and non-tariff barriers and eventually, the establishment of a customs union. All this was to culminate in the eventual creation of an economic and monetary union. However, with the passage of time, very little has been achieved even though the fifteen-member body is conscious of the potential benefits of enhanced cooperation. This has led to a two-tier approach towards a grand ECOWAS monetary union with most Anglophone members angling for a second monetary union because of the slow pace of the original initiative. This second monetary union in the ECOWAS sub-region is known as the West African Monetary Zone.

This chapter presents the antecedents of the WAMZ by reviewing literature dating back to the (O)AU protocols of 1963, as well as recent initiatives. It analyses the historical background and current happenings in some existing and defunct monetary unions on the African continent. It also takes a look back at the ECOWAS integration efforts with a brief discussion on the WAEMU. Finally, it gives a chronology of all the initiatives that were meant to usher the ECOWAS into a monetary union and eventually zeroes in on the WAMZ by giving a précis on an age-old monetary cooperation that existed during the colonial days, the West African Currency Board, and reviewing the economic structures of the countries.

3.1 The African Economic Community

As stated earlier, the initial drive towards integration in Africa was largely politically motivated. However, with the passage of time, African leaders have realized that a closer collaboration may not just be politically expedient but economically as well. Over the years, the (O)AU has been encouraging the strengthening of sub-regional groups and the creation of new ones in order to speed up the goal of economic and monetary unification. Consequent to the OAU Summit of 1963, African integration initiatives have been re-echoed at many other summits with a much more concrete position on integration coming in the wake of the 1980 OAU Extraordinary Summit in Lagos, Nigeria, following the adoption of a Plan of Action towards its achievement. This was buttressed by the signing of the Lagos Plan of Action and Final Act in Abuja, Nigeria, in June 1991, when the Heads of State and Government of the OAU signed the Treaty establishing the African Economic Community (AEC). But it was not until May 1994 that it came into force.

Together with the existing Regional Economic Communities (RECs), the AEC laid down a six-stage road map towards the creation of free trade areas, customs unions, a single market, a common central bank and a single African currency in not more than thirty-four years from 1994⁵⁸. The main RECs which subscribed to the AEC at the time the Treaty was signed were the ECOWAS, ECCAS, COMESA and SADC. The full membership of the AMU is yet to consent to it. The two CFA zones, which are already members of two of the aforementioned sub-regional groups, are also members of the AEC. The goals of the AEC, as stated in the Treaty, are to be achieved as follows.

Stage One: This involved, as enshrined in the Treaty, the strengthening of the RECs within a period of five years and the establishment of economic communities in regions where they did not exist.

Stage Two

- i. This stage involved the stabilizing of tariff and non-tariff barriers, customs duties and internal taxes existing at the date of entry into force of the Treaty by each REC in a period not exceeding eight years. Studies were to be conducted towards determining the time-table for the gradual removal of tariff and non-tariff barriers to regional and intra-Community trade and for the gradual harmonization of customs duties in relation to third states
- ii. It also sought to strengthen sectoral integration at both the regional and continental levels in all areas of activity, especially in the fields of trade, agriculture, money and finance, transport and communications, industry and energy; and
- iii. Coordination and harmonization of activities among the existing and future Economic Communities.

⁵⁸ Treaty establishing the AEC – Article 6. www.africa-union.org

Stage Three: This stage sought to establish a free trade area (FTA) in a period not exceeding ten years, through the observance of the time-table for the gradual removal of tariff and non-tariff barriers to intra-Community trade and the establishment of a customs union by means of adopting a common external tariff.

Stage Four: Stage four sought to coordinate and harmonize tariff and non-tariff systems among the various RECs with the view of establishing a customs union at the continental level by means of adopting a common external tariff in a period not exceeding two years.

Stage Five: To establish an African Common Market within a period not exceeding four years through:

- i. the adoption of a common policy in several areas such as agriculture, transport and communications, industry, energy and scientific research
- ii. the harmonization of monetary, financial and fiscal policies; and
- iii. the application of the principle of free movement of persons as well as the provisions regarding the rights of residence and establishment.

Stage Six: Within a period not exceeding five years, this stage was meant to achieve the

- i. consolidation and strengthening of the structure of the African Common Market, through including the free movement of people, goods, capital and services, as well as, the provisions regarding the rights of residence and establishment.
- ii. integration of all the sectors, namely economic, political, social and cultural and establishment of a single domestic market and a Pan-African Economic and Monetary Union; and

- iii. implementation of the final stage for the setting up of an African Monetary Union, the establishment of a single African Central Bank and the creation of a single African currency.

It is obvious that more than fourteen years after the Treaty establishing the AEC came into force, very little has been achieved through its six-prong approach to achieving an economic and monetary union. Many countries belong to more than one REC, making it difficult for them to abide by all regional level decisions. In addition to this, the planned removal of tariff and non-tariff barriers exists in word rather than in deed. These factors, in part, cast a cloud on the achievement of the AEC goal by the proposed date of 2028.

However, this has not prevented some regional groups from going ahead with integration efforts, some of which began even before the AEC Treaty was signed in 1994. A lot of attention has been paid to existing monetary unions in West, Central and Southern Africa in many research works. Apart from the WAMZ, there are ongoing efforts at revitalizing another monetary union in East Africa. These are discussed as part of the broad AEC goal of economic and monetary unification even though most of them preceded the (O)AU, and for that matter, the AEC itself.

3.1.1 The CFA Zone

The CFA zone, which has been in existence for more than sixty years, accounts for two of the world's four full monetary unions, the WAEMU and the Central African Economic and Monetary Community (CEMAC)⁵⁹. It started out as a group of French colonies in Africa, some of which pulled out after independence, and was later joined by two non-French colonies. Guinea, a former French colony, withdrew its membership from the CFA zone in 1958. So did

⁵⁹ The other two are the Euro Area and the Eastern Caribbean Currency Union (ECCU).

Madagascar in 1972 and Mauritania in 1973. Conversely, two non-French colonies, Equatorial Guinea and Guinea-Bissau, joined in 1985 and 1997 respectively⁶⁰. Mali exited at independence in 1960 but made a re-entry in 1987. This has brought the total number of countries in the Zone to fourteen.

The Zone has a population of about 135 million (CIA World Factbook, July 2010 est.), representing 17 percent of sub-Saharan Africa's population, accounts for 15 percent of Africa's GDP and produces 22 percent of its oil⁶¹. It consists of two sub-zones, two independent regional central banks and two distinct currencies. The two currencies are not directly convertible but are equally fixed to the euro (until 1999, to the French franc⁶²) at 655.957 CFA francs per euro, (Gulde, 2008). The WAEMU is the West African wing of the CFA zone with the *Banque Centrale des Etats de l'Afrique de l'Ouest* (BCEAO), which is located in Dakar, Senegal, as its central bank. It consists of eight countries whose export base is largely made up of agricultural commodities⁶³. It is a net importer of oil with Côte d'Ivoire as the only oil producing country. The WAEMU has a population in excess of 95 million (CIA World Factbook, July 2010 est.) and a 2006 per capita GDP of US\$588.5, (IFS *CD-ROM*, 2009). Despite recent civil strife, Côte d'Ivoire, the world's leading exporter of cocoa, remains the WAEMU's largest economy accounting for about 35 percent of the region's GDP. Table 3.1 gives a brief overview of some macroeconomic indicators in the CFA zone.

⁶⁰ Equatorial Guinea is a former Spanish colony and Guinea-Bissau, a former Portuguese colony.

⁶¹ Gulde (2008).

⁶² It was pegged at FFR1 to CFA franc 50 from 1948 until 1994, when it was revised to FFR1 to CFA franc 100.

⁶³ WAEMU members: Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo.

Table 3.1 Economic Trends of the CFA Zone

	Inflation	Real GDP Growth	Government Balance	Current Account	Export Growth
CEMAC					
1970-79	10.8	2.9	-3.2	7.6	0.9
1980-89	8.3	3.8	-3.1	-6.4	13.9
1990-99	5.7	6.8	-5.5	-10.7	4.1
2000-06	3.1	7.5	4.6	-6.5	17.0
WAEMU					
1970-79	10.2	3.3	-4.6	-8.0	6.7
1980-89	12.0	2.1	-5.2	-8.6	2.9
1990-99	9.5	3.5	-4.4	-7.0	9.6
2000-06	2.4	3.3	-2.5	-7.0	5.5

Source: Gulde (2008)

The CEMAC⁶⁴, on the other hand, is a group of six Central African countries, most of which are oil producers, thus, making the region a net exporter of oil⁶⁵. CEMAC's population stood at about 39.8 million (CIA World Factbook, July 2010 est.) and had a per capita GDP of US\$1,281.4 as of 2006 (IFS, 2008). The *Banque des Etats de l'Afrique Centrale* (BEAC), based in Yaounde, Cameroon, is the central bank of the union.

France guarantees the convertibility of the CFA franc into the euro and has representatives on the boards of the two central banks to forestall the circumvention of the rules. However, three important conditions must be met for the convertibility agreement to continue to hold.

⁶⁴ The French acronym is CEMAC.

⁶⁵ CEMAC members: Cameroon, the Central African Republic, Chad, Equatorial Guinea, Gabon and the Republic of Congo. Of the six, Gabon, Cameroon, and the Republic of Congo (the traditional oil producers) have recently been joined by Chad and Equatorial Guinea as oil exporters.

- a) At least 20 percent of sight liabilities of each central bank must be covered by foreign exchange reserves.
- b) At least 50 percent (previously 65 percent) of each central bank's reserves is supposed to be held with the French Treasury in an operations account; and
- c) Increasing interest rate penalties apply if there is an overdraft⁶⁶.

Since their creation, the two CFA francs have been devalued only once (on January 12, 1994). This came on the back of a persistent deterioration of their terms of trade due largely to a massive appreciation of the French franc (the erstwhile anchor currency) in the mid-1980s. This caused the Zone to lose competitiveness, leading to a 100 percent devaluation of the currencies.

Despite its shortcomings, the CFA zone is generally seen as having brought macroeconomic stability to the region. It is envisaged that, like most African countries, the members of the CFA zone would have done worse with independent monetary policies than with a common one. Its members have far outperformed many of their fellow African countries on the score of price stabilization and economic growth. This has been attributed to the benefit of a single central bank which has served as an agency of restraint on fiscal policy, thus, keeping government expenditure in check at a time when other African countries operated what has become known as the "printing press regime", whereby government deficits were financed by the central bank through the printing of new currency notes resulting in escalating inflation tendencies.

However, the peg to the euro raises a lot of questions as to the Zone's ability to hold together in the face of similar conditions that led to the 1994 devaluation of the two currencies.

As it stands now, the CFA currencies are pegged to the euro, so they could suffer the same fate

⁶⁶ Masson and Pattillo (2005) underscore some of the punitive measures in case a country's operations account goes into deficit for thirty days as the reduction by 20 percent of refinancing ceilings for countries in deficit and by 10 percent for countries whose surplus is less than 15 percent of its money supply.

as they did in the mid-1980s, if the euro appreciates. It is noteworthy that despite the monetary union, the Zone is still characterized by low internal trade with most of its export commodities destined for France and the rest of Europe.

3.1.2 The Common Monetary Area

Though not a full monetary union, the Common Monetary Area (CMA)⁶⁷ is a symbol of deep monetary integration in Africa. Presently, the CMA comprises South Africa, Lesotho, Swaziland and Namibia. Unlike the two CFA zones, there are more than one currency and more than one central bank in the region. The CMA exists in the world's oldest customs union, the Southern African Customs Union (which dates back to 1910)⁶⁸, which consists of all the CMA countries in addition to Botswana⁶⁹.

Before the creation of the CMA, Botswana, Lesotho, Namibia and Swaziland had adopted the South African pound in the 1920s in a move to deepen trade within the region⁷⁰. This later led to the formal establishment of the CMA in 1974 – made possible by an agreement among Lesotho, South Africa and Swaziland, with Namibia participating informally. Subsequent to independence, the countries established their respective central banks and issued currencies, but continued to peg to the South African rand at parity. The rand circulates in all the CMA countries except in Swaziland – which decided in 1986 to no longer accept the rand as legal tender – but the other currencies are not legal tender in South Africa⁷¹. The currencies are fully convertible, but as noted by Masson and Pattillo (2005), exchange rates within the CMA are not irrevocably fixed.

⁶⁷ Formerly the Multilateral Monetary Area (MMA)

⁶⁸ El-Agraa (2007)

⁶⁹ Botswana left the CMA in 1976

⁷⁰ Now the South African rand

⁷¹ Kenen and Meade (2008) and Masson and Pattillo (2005)

The Area has a population of over 52.5 million, with an average GDP per capita of about \$1,764 and inflation of 5.6 percent between 2000 and 2006 as evidenced in Table 3.2. Lesotho is the weakest member, with an average per capita GDP of \$478, with the strongest member being South Africa (\$3,239) over the same period.

Table 3.2 CMA Selected Indicators, 2000-2006

Indicator	South Africa	Lesotho	Namibia	Swaziland
GDP per capita (Constant 2000 US\$)	3239	478	1984	1354
GDP Growth Rate (%)	4.1	3.4	4.3	2.3
Money Growth (M2) in (%)	13.7	11.6	13.2	10.4
Inflation (%)	5.1	7.4	2.7	7.3
Population (2006)	47,391,025	1,994,888	2,046,555	1,137,915

Source: Calculated from the World Development Indicators CD-ROM (2008)

South Africa's dominance in the region is underpinned by the fact that apart from its economic strength, its central bank, the South African Reserve Bank (SARB), determines the monetary policy of the CMA, based primarily on circumstances in the South African economy. The SARB shares seigniorage revenue with Lesotho and Namibia due to the continual circulation of the rand in those countries⁷². In addition to this, the SARB cooperates with the other countries on matters of exchange rate policy. Masson and Pattillo (2005) argue that the benefits derived by the smaller countries in the CMA far outweigh the costs since it has made it possible for them to trade extensively with South Africa, resulting in similarities of terms of trade shocks. Table 3.3 portrays the extent of trade between South Africa and the rest of the CMA countries.

⁷² The disadvantages of this kind of arrangement have been spelt out in chapter 2

Table 3.3 CMA Trade with South Africa, 2001

Indicator	Lesotho	Namibia	Swaziland
Percentage of total trade	85	55	70
Percentage of GDP	104	47	112

Source: Masson and Pattillo (2005)

The WAMI (2006) sums up the characteristics of the CMA as follows:

- a) the four countries have their respective central banks, which are responsible for monetary policies, but the SARB effectively formulates monetary policy
- b) there are no restrictions on the transfer of funds, be it current or capital, within the region
- c) the South African rand serves as legal tender in all the participating countries, except Swaziland. But these countries have their respective currencies; and
- d) the currencies within the region are pegged at par value to the rand.

3.1.3 The East African Community

The East African Community (EAC), as the name suggests, is an eastern African economic group which originally consisted of Kenya, Tanzania and Uganda. The EAC, inclusive of Burundi and Rwanda, has a population of more than 124.5 million, with an average per capita income of between \$104 (Uganda) and \$415 (Kenya) as indicated in Table 3.4.

Table 3.4 Selected Indicators in EAC 2000-2006

Indicator	Burundi	Kenya	Rwanda	Tanzania	Uganda
GDP per capita (Constant 2000 US\$)	104	415	241	301	257
GDP Growth Rate (%)	2.2	3.5	5.5	6.2	5.6
Money Growth (%)	18.1	10.4	17.1	21.2	16.5
Inflation (%)	9.6	9.1	6.7	4.4	4.4
Population (2006)	8,173,070	36,553,490	9,464,241	39,458,709	29,898,598

Source: Calculated from the World Development Indicators CD-ROM (2008)

As far back as 1917, Kenya and Uganda established a customs union which was later joined by Tanganyika (now Tanzania) after ten years of its operation. However, it was not until June 1967 that the Treaty establishing the EAC was signed. Of particular interest to this study is the fact that the EAC constituted a pseudo monetary union, the structures of which were set up during the colonial period. This was accentuated by the establishment, in 1919, of the East African Currency Board (EACB) and the use of a single currency, the East African shilling, until 1966, with the shilling tied to the pound sterling. Like all other British-controlled currency boards, the EACB was responsible for issuing and redeeming local currency for sterling with no restrictions on capital mobility.

Like their counterparts in West Africa, who broke away from British controlled monetary arrangements after independence, the EAC members went on to establish central banks and issued national currencies shortly after independence, with the view of solidifying their political and economic independence. This was hastened by the depreciation of the pound sterling, which forced the countries to abandon the peg in 1967 to pursue independent monetary policies. However, this did not end monetary cooperation among them, since the three central bank governors consented to meet regularly to liaise on monetary policies. In addition to this, free capital mobility was maintained and their respective currencies were accepted across borders and were fully convertible at parity.

Kenya's economic dominance in the Community, nevertheless, did not go down well with the other members. Due to this, in early 1967 Tanzania nationalized its banks, restricted the free flow of its currency and instituted exchange rate controls on both Kenya and Uganda to forestall capital flight. The last two policies were repeated in 1970 after a reprieve in November 1967. This heightened tensions in the Community as the two other countries moved in retaliation

to Tanzania's protectionist policies, thus, culminating in the collapse of the EAC in 1977 and its official dissolution in 1983. The British Broadcasting Corporation (1999) attributes the collapse of the Community to the fact that "Kenya and Tanzania respectively, followed divergent capitalist and socialist policies, and Uganda experienced ongoing civil war." In addition to this, Uganda, and Tanzania in particular, felt that the Community benefitted Kenya more since it was the most industrialized of the three.

East African leaders have sought to resuscitate the EAC in recent times. In November 1993, an agreement was signed to establish a Permanent Tripartite Commission for East African Cooperation to herald the establishment, in March 1996, of the EAC's Secretariat in Arusha, Tanzania. The Treaty that revived the EAC was finally signed in November 1999, and the Community was formally launched in January 2001 with Kenya, Tanzania and Uganda as members⁷³. The 1999 Treaty sought to establish a customs union, common market, monetary union and eventually, a political federation.

The rebirth of the EAC, nonetheless, has failed to boost intra-regional trade, with trade still as low as it used to be before the demise of the Community. Intra-regional trade has been on the decline as the countries have sought to trade more with industrialized countries than within the region. With the coming on stream of the Lomé Convention⁷⁴ in February 1975, the United States government-initiated African Growth and Opportunities Act (AGOA)⁷⁵ and other trade incentives offered by other industrialized countries, a lot of avenues for improved trade relations with industrialized countries have been opened to African countries. All of the original three

⁷³ Burundi and Rwanda joined in 2007.

⁷⁴ The Lomé Convention established a trade non-reciprocity agreement between the EU and 71 African, Caribbean and Pacific (ACP) group of States. The agreement, which has been reviewed many times, allowed some commodities from the ACP countries to enter the EU tax-free. Lomé is the capital of Togo.

⁷⁵ AGOA was signed into law on May 18, 2000. Amendments were signed on August 6, 2002. "AGOA offers tangible incentives for African countries to continue their efforts to open their economies and build free markets." The amended AGOA "substantially expands preferential access for imports from beneficiary sub-Saharan African countries", www.agoa.gov.

EAC members are eligible to AGOA and have experienced improved trade relations with the US and other industrialized countries⁷⁶. This has dealt yet another blow to the already low intra-EAC trade and as such, trade remains low as indicated in Table 3.5 below.

Table 3.5 Bilateral Trade in EAC as a Percentage of Countries' Total Exports/Imports

	Exports 2000-2006⁷⁷					Imports 2000-2006⁷⁸				
	Ke	Bu	Rw	Tz	Ug	Ke	Bu	Rw	Tz	Ug
Kenya	0	1.08	2.70	8.17	17.45	0	0.01	0.00	0.40	0.26
Burundi	5.93	0	6.34	0.12	6.34	10.74	0	0.44	7.62	3.20
Rwanda	0.06	0.47	0	0.05	0.45	19.96	0.82	0	1.53	4.99
Tanzania	1.05	3.05	0.50	0	1.28	7.03	7.03	0.00	0	0.32
Uganda	9.01	1.46	3.42	1.34	0	31.02	0.03	0.06	0.84	0

Source: Calculated from the IMF's Direction of Trade Statistics (2007)

As evidenced in the table above, Kenya continues to dominate the region. It dispatched about 29.4 percent of its total exports in 2000-2006 to the four other countries, and accounted for 31.02 percent of Uganda's total imports and 19.96 percent of Rwanda's. Nevertheless, all in all, the EAC countries trade more with non-EAC members. Consequently, intra-EAC trade, as indicated by Figure 3.1, has been low with trade dropping from a high of 11.96 percent in 2003 to 10.09 percent in 2005.

Even though the monetary union objective seemed quite a distant goal at first, Article 82 of the Treaty specifies that the partner countries will "Cooperate in monetary and financial matters and maintain the convertibility of their currencies as a basis for the establishment of a monetary union."⁷⁹ The original emphasis on monetary unification was on currency

⁷⁶ The Direction of Trade Statistics reveal that trade with the US and the EU has improved over the years.

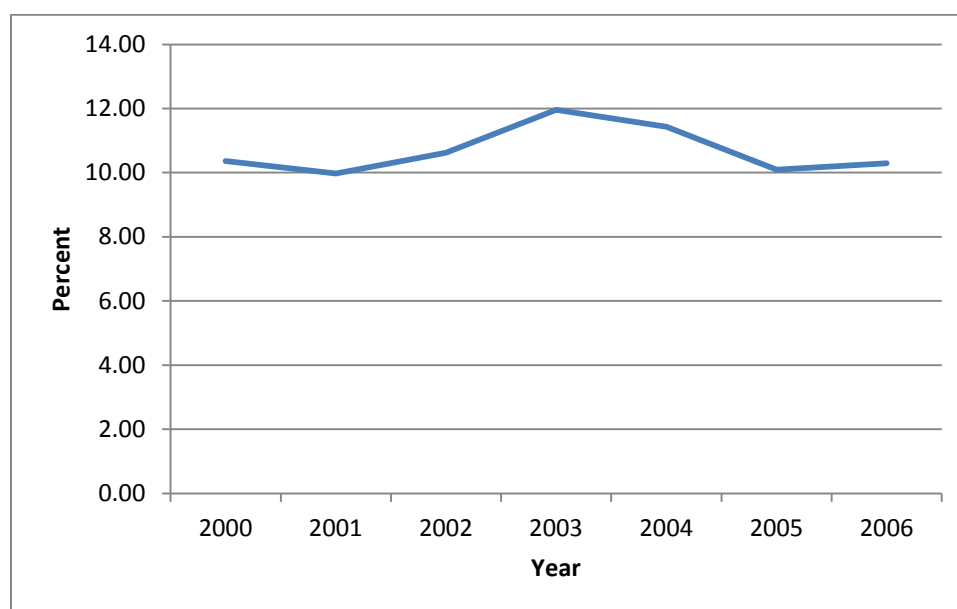
⁷⁷ Percentage of 'row' country's total exports that go to 'column' country.

⁷⁸ Percentage of 'row' country's total imports that come from 'column' country.

⁷⁹ East African Community, "East African Community – the Treaty." www.eacq.org/eac-TheTreaty.htm

convertibility at parity, harmonizing macroeconomic policies (that is, exchange rate, interest rate, monetary and fiscal policies) and working towards convergence⁸⁰.

Figure 3.1 Trend of Intra-EAC Trade as a Percentage of Total Trade



Source: Calculated from the IMF's Direction of Trade Statistics (2007)

However, in recent times, discussions of this nature have focused on the creation of a euro-type monetary union. In line with this, the EAC abolished all trade barriers on July 1, 2010 to formalize the commencement of a common market, with the view of forming a monetary union by 2012, leading to the establishment of a political federation at a later date.

3.2 The Economic Community of West African States

The ECOWAS, which was created in May 1975, is a sub-regional group of fifteen countries – eight Francophone, five Anglophone and two Portuguese-speaking – whose main aim is to promote economic and monetary integration and foster improved trade relations among its members. There is already a monetary union within the ECOWAS called the West African

⁸⁰ Masson and Pattillo (2005).

Economic and Monetary Union⁸¹. As discussed earlier, the members of this monetary union have subscribed to a single monetary policy issued by a common central bank and use a common currency called the CFA franc. The seven other countries are Cape Verde (a former Portuguese colony), The Gambia, Ghana, Guinea (a former French colony), Liberia (which was never colonized but has historical ties with the United States), Nigeria and Sierra Leone, all of which were once colonized by the British. In all, eight currencies are in use in the ECOWAS. But attempts have been made towards currency consolidation and the harmonization of the conduct of fiscal and monetary policies within the sub-region in times past, as encapsulated in the succeeding paragraphs.

3.2.1 ECOWAS Monetary Integration Efforts

The ECOWAS began the process of monetary integration with an attempt to eliminate currency inconvertibility, which had resulted in the use of some hard currencies as the means of settlement in the sub-region, by establishing the West African Clearing House (WACH) mechanism in 1975. This mechanism was established to provide a multilateral clearing mechanism for trade within the region. In other words, the WACH was meant to simplify intra-regional trade transactions by providing a payment mechanism for the clearing and settlement of intra-regional transactions, as well as to encourage the use of national currencies in transactions, (WAMI, 2006). Furthermore, the WACH sought to promote trade liberalization among member states and to enjoin them to deepen monetary and economic cooperation amongst themselves. In order to encourage the use of domestic currencies in intra-regional trade, the West African Unit of Account (WAUA) was introduced to serve as a benchmark for determining the relative strength of the currencies in the WACH payment and clearing mechanism. Commercial banks

⁸¹ Refer to Appendix 4 for the map and sub-groupings of the ECOWAS.

were not left out since they deal more directly with the citizenry. As a result, the West African Bankers' Association (WABA)⁸² was formed in 1978 with the objective of exchanging information on banking practices, strengthening links within commercial banks and to serve as an intermediary between the central banks and commercial banks at the sub-regional level.

Ojo (2003) observes that the smooth functioning of the WACH was contingent on the undertaking by member countries to generate unrestricted conversion of their national currencies into the WAUA for eligible transactions. However, the system did not operate as expected. Very little intra-regional trade was routed through the system and there was a rampant use of foreign currencies for the settlement of transactions – the very practice the WACH sought to discourage. In addition, due to cumbersome documentation requirements by central banks which led to delays in crediting exporters' accounts, the system became fraught with arrears. This made the mechanism unattractive to exporters in the sub-region. The WAMI (2006) lists the challenges of the WACH as follows:

- a) the major creditor central banks discouraged or suspended transactions with defaulting debtor banks with a view to scaling down its exposure
- b) the banks with accumulated settlement arrears or permanent debtor positions also suspended further utilization of the mechanism; and
- c) some member central banks practically reduced the volume of transactions allowed to pass through the system due to balance of payments constraints.

By and large, the WACH was a failure. There was, therefore, the need to review it and get member states to make a firm commitment to agreed principles.

⁸² WABA embraces commercial banks, development banks as well as other credit institutions in the sub-region

The ECOWAS Monetary Cooperation Programme

The ECOWAS Monetary Cooperation Programme (EMCP) was established in 1987 to facilitate the migration from the use of independent currencies to a single regional currency. Under the EMCP, a number of changes took place. The apparent operational deficiencies of the WACH had necessitated a review of its activities culminating in its replacement by the West African Monetary Agency (WAMA) in 1995. The WAMA commenced operations in March 1996, in Freetown, Sierra Leone. It was charged with the monitoring, coordination and implementation of the EMCP and to ensure the introduction of policies and programmes towards the realization of the single currency goal of the sub-region. Among the objectives of the WAMA, as stated on its website (www.wama-amao.org), are the following:

- a) promotion and use of national currencies for regional trade and transactions
- b) bringing about savings in the use of foreign reserves for member states
- c) encouraging and promoting trade and exchange rate liberalization; and
- d) initiating policies and programmes on monetary integration and cross border investments that will lead to a single monetary zone in West Africa.

To achieve these and the other objectives, the WAMA was supposed to, among other functions, define policies and programmes to promote monetary and fiscal harmonization and cooperation in the sub-region; and operate a Credit Guarantee Fund mechanism and Travelers Cheque Scheme (which were lacking in the WACH).

A set of primary and secondary convergence criteria, meant to help inject credibility into the intended monetary union, was adopted under the EMCP. The strict adherence to these criteria was paramount to the realization of the goal of an ECOWAS monetary union. The primary convergence criteria are as follows:

- a) maintenance of exchange rate variability between 5 and 10 percent
- b) achievement of single digit inflation
- c) achievement and maintenance of budget deficit to GDP ratio of between 3 and 5 percent;
and
- d) achievement and maintenance of a ceiling of 5 to 10 percent of the previous year's tax revenue on central bank financing of budget deficits.

The Committee of ECOWAS Central Bank Governors, at a meeting in Dakar, Senegal, on May 4-5, 2000, outlined three phases of achieving the ECOWAS-wide monetary union. Masson and Pattillo (2001) outline the phases as follows:

Phase I: Harmonizing exchange controls, liberalizing capital markets, establishing rigorous macroeconomic management and reinforcing structural policies, meeting the convergence criteria and harmonizing statistics, putting in place a regional single market, liberalizing labour markets, establishing an exchange rate mechanism in which all member countries' currencies would participate, making widespread the use of the WAUA and revitalizing the WAMA, and creating a Community Monetary Institution, as a transition institution to a single regional bank.

Phase II: Evaluating and adapting the policies implemented in Phase I, reducing the fluctuation margins of the exchange rate mechanism, and harmonizing taxation, in particular on income from saving.

Phase III: Irrevocably fixing parities and passage to a single currency managed by the single regional bank.

However, like many other agreements before it, the EMCP was not adhered to owing to political lethargy and the challenge of dissolving an already existing and working monetary union (i.e. the WAEMU) in order to start a new one. This led to multiple postponements of the

single monetary zone from the initial date of 1992 to 1994, 2000 and 2004. Presently, the realization of this project is based on the commencement and successful operation of a second monetary zone – the WAMZ. Once this has been achieved, it is expected that the WAEMU will be merged with the WAMZ by 2020.

3.3 The West African Monetary Zone

The consistent failure of the ECOWAS member countries to achieve the convergence criteria and satisfy the dictates of the EMCP led to several postponements of the commencement of the proposed West African monetary union. It was obvious that it was going to be difficult for all the fifteen countries to comply at the same time for it to become a reality. Realizing the snail pace at which the process was moving, the Authority of Heads of State and Government of the ECOWAS proposed the “fast track approach” in December 1999, which involved, among others, the creation of a parallel monetary union to that of the WAEMU. Consequently, Ghana and Nigeria consented to form the WAMZ as a second monetary union in the sub-region⁸³. Three more countries – The Gambia, Guinea (the only French-speaking country) and Sierra Leone – joined the two in December 2000, in signing the Statutes that established WAMZ with Liberia and Cape Verde (the other non-Anglophone country) as observers.

This resulted in the establishment, in January 2001, of the West African Monetary Institute (WAMI) – the Institute mandated to undertake technical preparations for the establishment of a common West African Central Bank – with its headquarters in Accra, Ghana. Since its establishment, the WAMI has worked towards the realization of the WAMZ programme by constantly reminding member countries about their commitments, in order to

⁸³ Appendix 4D (I-IV) give an outline of the organs, institutions, chronology of events and landmark decisions of the WAMZ.

forestall the pitfalls of the EMCP. The core functions of the WAMI, as summarized on its website, are as follows:

a) Monitor State of Convergence

The WAMI is supposed to monitor members' performance as regards the convergence criteria and submit developments in such countries to the Convergence Council, the decision making body of the Zone, on a quarterly basis. The said reports would include recommendations on policy measures needed to be adhered to by members in order to stay on track.

b) Harmonize Regulations and Design Policy Framework

The WAMI is supposed to ensure the harmonization of all regulations on financial markets, including laws relating to bank and non-bank financial institutions, in order to create a level playing field for all operations within the Zone. It is also mandated to ensure the harmonization of monetary policy, banking regulations and accounting practices of all the participating countries of the WAMZ, to allow for comparability and formulation of a common monetary policy for all members. To ensure effective banking supervision in the Zone, the WAMI is expected to make proposals on an institutional framework for a centralized supervisory authority.

c) Promote Regional Payment System

The WAMI, in collaboration with the WABA, is also expected to promote the development of the payments system to facilitate the implementation of a common monetary policy. The achievement of this function will facilitate efficient transfers within the Zone.

d) Exchange Rate Mechanism and Conversion Rate

The Institute would study the issue of exchange rate parities within the WAMZ and recommend the appropriate exchange rate mechanism and parities for the existing currencies in

the Zone. The WAMI would also provide a basis for the establishment of an exchange rate mechanism with appropriate bands of fluctuation for currencies in the Zone. It has also been entrusted with determining the value of the common currency and the conversion rates of national currencies into the new currency.

e) Organization of Sensitization

The WAMI would embark on a programme to sensitize citizens of the participating countries in order to create awareness and support for the new currency, the eco, in collaboration with National Sensitization Committees.

f) Design and Technical Preparation of the New Currency

The WAMI is responsible for the preparation of background work on the new currency. This includes the name, determination of par value and denominations.

The WAMI has been operating an ERM since April 2002⁸⁴. Like the EU's ERM, the WAMZ's ERM was created for the purpose of transitioning the countries into a permanent exchange rate fix. The specific objectives of the ERM, as stated by Obadan (2002), are stated thus:

- a. to create a zone of exchange rate and macroeconomic stability
- b. to promote convergence of the economies
- c. to enhance trade among the countries; and
- d. to promote a single market.

In line with this, the WAMI created a currency unit, the zonal basket of currencies (ZOCU)⁸⁵, which was defined as the weighted average of the dollar/SDR value of each of the currencies of the WAMZ countries, (Obadan, 2002). Currencies were to remain within a ± 15

⁸⁴ Obadan (2002).

⁸⁵ The weights depended on the size of a country's GDP.

percent band, beyond which intervention was inevitable. According to Obadan (2002), the WAMI established the value of the ZOCU, as of January 1, 2001, as:

$$\text{ZOCU1} = \text{US\$1.3087/SDR or}$$

$$\text{ZOCU1} = \text{SDR0.76407/US\$}.$$

The amounts of the currencies in the basket were as follows:

$$\begin{aligned} \text{ZOCU1} &= + 82.93 \text{ Nigerian Naira} \\ &+ 827.90 \text{ Ghanaian Cedi} \\ &+ 159.48 \text{ Guinean Franc} \\ &+ 0.097 \text{ Gambian Dalasi} \\ &+ 55.85 \text{ Sierra Leonean Leone} \end{aligned}$$

However, the WAMI, in preparation for the original January 2003 issue of the eco, recommended that the ERM should be anchored on the US dollar (within a band of ± 15 percent) with bilateral rates derived from the cross rates between each currency's central rate with the dollar. This effectively set the ZOCU aside.

The ERM was supposed to run concurrently with two sets of convergence criteria. However, as a result of member countries' inability to meet the convergence criteria, the planned introduction of the single currency had to be postponed from January 2003 to January 2005, then to December 2009 and currently, January 2015. The primary criteria are as follows:

- a) achieve and maintain price stability by recording single digit end-period inflation rate by 2003 and 5 percent by 2004
- b) ensure sustainable government fiscal position by reducing the ratio of budget deficit (excluding grants) on commitment basis to GDP to 4 percent or less throughout the period 2003-2005

- c) limit central bank financing of government budget deficit, a percent of previous year's tax revenue, to 10 percent or less throughout the period 2003-2005; and
- d) maintain sufficient level of gross official foreign exchange reserves of at least three months of import cover throughout the period 2003-2005.

The secondary criteria are:

- a) prohibition of new domestic arrears and liquidation of existing ones
- b) tax revenue to GDP equal to or greater than 20 percent
- c) wage bill to tax revenue equal to or less than 35 percent
- d) public investment to tax revenue equal to or greater than 20 percent
- e) maintain real exchange rate stability; and
- f) positive real interest rate.

The issue of a common currency is not new to the WAMZ. Four of the five WAMZ countries once shared a common currency. Some of the main differences between that one and the proposed monetary union scheduled for January 2015 have to do with the political dispensations in place then and now, and the fact that the previous one constituted a currency board with the WAMZ meant to be a full monetary union. The West African Currency Board was instituted by the British colonial government to facilitate the conduct of monetary policy in the British protectorates.

3.3.1 The West African Currency Board

To further consolidate its control over its colonies, the British-owned African Banking Corporation was established in Lagos, Nigeria, in 1892, to supply West African countries with

new British coins and repatriate redundant silver coins to London⁸⁶. Two years later, in 1894, these responsibilities were passed to the Bank of British West Africa. In 1907, the West African pound was introduced for circulation in The Gambia, the Gold Coast (now Ghana), Nigeria and Sierra Leone and was adopted by Liberia later that year⁸⁷, even though it was not a British protectorate.

The Emmott Committee⁸⁸ Report of 1912 made two recommendations. It recommended that a new silver coinage should be minted for West Africa and that a Currency Board should be established in London to manage it with powers to buy securities, have the coinage minted and issue them at face value on behalf of the colonies, (Akinrinsola, 2003). The WACB was established in 1912 and functioned as the issuer of the West African pound and shillings. In 1916, the Currency Board made its first note issue. In addition to the aforementioned countries, two more territories, the British sections of Togo and Cameroon, which adopted the West African currency in 1914 and 1916 respectively after Germany had surrendered them to Britain, used the West African pound.

However, with the attainment of independence, the countries began to pull out of the WACB by establishing central banks and issuing currencies to accentuate their political freedom. Ghana set the tone in July 1958 with Nigeria following suit in 1959. Unlike Ghana, WACB notes and coins continued to circulate in Nigeria until July 1962, when they ceased to be legal tender. The British Cameroons became part of Cameroon and automatically joined the CFA zone, and the British Togo (the Trans-Volta Togoland) became part of Ghana. The Gambia's Currency Board, which was established in October 1964, issued the first domestic coins in February 1965, with Sierra Leone issuing its currency in 1964. This effectively led to the demise of the WACB.

⁸⁶ The Central Bank of The Gambia: <http://www.cbg.gm/currency-mes/history-dalasi.html>.

⁸⁷ Liberia switched to the US dollar in 1943.

⁸⁸ The Emmott Committee was set up to examine the currency system in the colonies.

3.3.2 Overview of the WAMZ Economic Structure

The West African Monetary Zone, which has a total land area of about 1,492,125 sq km, is made up of five countries with an approximate combined population of 188 million (most of whom are engaged in agricultural activity), the most populous being Nigeria and the least populous being The Gambia. Nigeria has the largest land area, followed by Guinea, Ghana, Sierra Leone and The Gambia in that order. Nigeria's land area is almost four times bigger than Guinea's, as shown in the table below.

Table 3.6 WAMZ Land Area and Demographics as of July 2008

Country	Land Area Sq. km	Population
The Gambia	11,300	1,735,464
Ghana	239,460	23,382,848
Guinea	245,857	9,806,509
Nigeria	923,768	146,255,312
Sierra Leone	71,740	6,294,774

Source: Central Intelligence Agency, World Factbook (2009)

The Zone consists of two of the three biggest economies in the ECOWAS – Nigeria and Ghana – as well as the smallest, The Gambia. The region also includes Sierra Leone – a country which in 2002 ended a decade-long civil strife and has begun to rebuild its stuttering economy. As of 2006, the WAMZ had a combined GDP of US\$119.7 billion with Nigeria accounting for approximately 81.6 percent and The Gambia, approximately 0.2 percent. Moreover, the Zone experienced an average real GDP growth of about 5.5 percent between 2001 and 2007, (ADF⁸⁹, 2008).

⁸⁹ African Development Fund, a subsidiary of the African Development Bank.

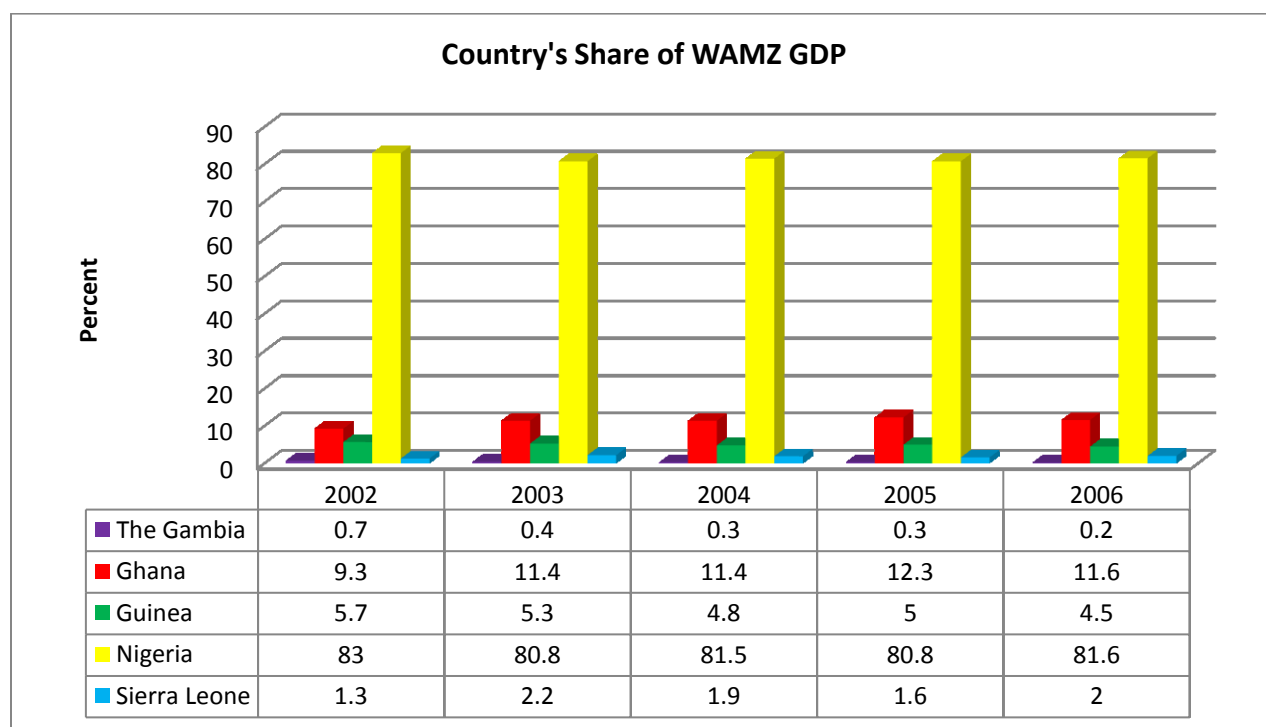
Table 3.7 WAMZ Real GDP Per Capita, Constant 2001 US Dollars

Country	2001	2002	2003	2004	2005	2006
The Gambia	264.77	269.96	276.08	282.99	282.83	286.14
Ghana	270.41	282.10	291.54	301.96	312.47	308.22
Guinea	365.62	377.52	376.06	380.73	383.47	404.87
Nigeria	365.41	363.91	393.62	406.51	421.20	439.54
Sierra Leone	262.19	293.87	315.82	332.03	344.60	385.31
WAMZ	305.68	317.47	330.62	340.84	348.91	364.82

Source: ECOWAS National Accounts (www.ecostat.org)

From Figure 3.2, it is obvious that Nigeria is the regional superpower, not just because of its huge population and land area, but also its economic size. However, this has not reflected in its per capita GDP, as shown in Table 3.7.

Figure 3.2 Countries' Share of WAMZ GDP



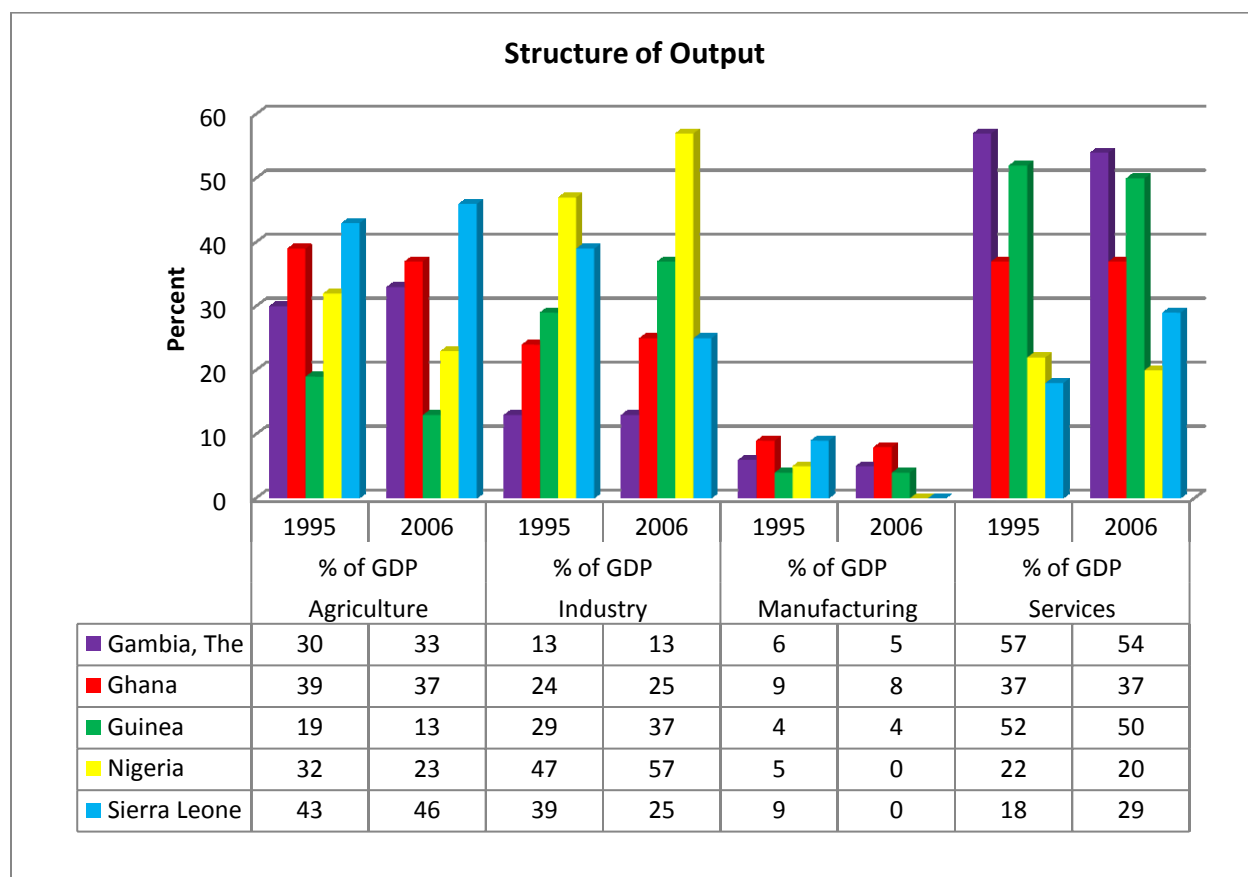
Source: Calculated from the ECOWAS National Accounts (www.ecostat.org)

The countries in the WAMZ, though rich in resources⁹⁰, remain poor. Indeed, before the turn of the twenty-first century, all five of the countries technically qualified for the IMF and World Bank's Heavily Indebted Poor Countries (HIPC) initiative – an initiative that was meant to bring debt cancellation to countries that were considered too poor to be able to repay them. Nigeria was later dropped in 1998, because it was eligible for non-concessional loans from the World Bank's International Bank for Reconstruction and Development (IBRD) and soft lending from the International Development Association (IDA). Despite the vast array of natural resources, these countries have stagnated because of corruption, mismanagement, droughts, civil wars, institutional failures, lack of export diversification, trade restrictions and so on.

After decades of domination, in recent years the agriculture sector seems to have given way to the services sector in most of the WAMZ – as is beginning to emerge in the whole of Africa. Generally, agriculture's share of GDP has fallen in favour of the services sector, considering the average of 60 percentage stake it had in GDP shortly after independence. The industrial sector does not seem to be doing too badly either (propelled by resource-based undertakings and construction) but all is not well with manufacturing, an industrial sub-sector. Figure 3.3 gives a summary of the structure of output in the WAMZ.

⁹⁰ Check Appendix 1 for list of resources.

Figure 3.3 Structure of the WAMZ Economy



Source: World Bank's World Development Indicators CD-ROM (2008)⁹¹

The Agriculture Sector

The over-reliance on primary commodities as their primary foreign exchange earner (as shown in Table 3.8) has not helped matters. Except natural resources, which have done relatively well on the world markets, WAMZ exports in general have not fared so well. The share of agriculture in global merchandise trade has fallen to a paltry 7 percent, as compared to 25 percent in the 1960s, and sub-Saharan Africa has lost grounds in global agricultural exports. According to the FAO (2005), “There is a gradual marginalization of sub-Saharan African

⁹¹2006 manufacturing shares for Nigeria and Sierra Leone were unavailable at the time. They are not zero.

agricultural export in international markets, with their share of global exports declining gradually from almost 10 percent four decades ago to about 3 percent today.” Despite this, agriculture is the number one employer in the WAMZ.

Table 3.8 Primary Exports of WAMZ Countries

Country	Primary Exports	Primary Imports
The Gambia	Peanut products, fish, cotton lint, palm kernels, re-exports	Foodstuffs, manufactures, fuel, machinery and transport equipment
Ghana	Gold, cocoa, timber, tuna, bauxite, aluminum, manganese ore, diamonds	Capital equipment, petroleum, foodstuffs
Guinea	Bauxite, alumina, gold, diamonds, coffee, fish, agricultural products	Petroleum products, metals, machinery, transport equipment, textiles, grain and other foodstuffs
Nigeria	Petroleum and petroleum products 95%, cocoa, rubber	Machinery, chemicals, transport equipment, manufactured goods, food and live animals
Sierra Leone	Diamonds, rutile, cocoa, coffee, fish	Foodstuffs, machinery and equipment, fuels, lubricants, chemicals

Source: Central Intelligence Agency, World Factbook (2008)

The Gambia and Ghana are heavily reliant on agricultural exports, as shown in Tables 3.8 and 3.9. Nigeria though is an exception. It is a country whose export sector is dominated by crude oil exports, with the sector accounting for 97 percent of all exports in 2005, (WDI, 2007). As the world’s eighth and Africa’s number one crude oil exporter, Nigeria’s agricultural exports sector has been swallowed up by the oil sector. Before the oil sector took centre stage, agricultural exports accounted for 62 percent of all of its exports – with the country dominating world groundnuts (i.e. peanuts), cocoa and palm oil exports. However, increased productivity, coupled with windfall earnings from the oil sector, led to the neglect of the agricultural sector. This made agriculture less attractive, causing youth to abandon their farms in order to seek for

jobs in the better paying oil sector. This resulted in a sharp decline in agricultural output, rendering Nigeria food self-insufficient. The appreciating value of the naira (the local currency) and the upsurge in commodity prices caused it to lose agricultural export competitiveness. Despite this, the agriculture sector accounts for about 70 percent of all employment, with most of them engaged in subsistence production. The sector accounted for 41 percent of GDP in 1999, a drop of 24.7 percent from its 1957 share.

Agriculture is Ghana's most important economic sector, employing about 60 percent of the active workforce on a formal and informal basis and accounting for nearly 40 percent of GDP and export earnings. The sector is dominated by cocoa and timber exports, with the former accounting for 77 percent of all exports in 2005. At the beginning of the 1970s, the sector accounted for more than half of GDP and employed more than 62 percent of the labour force. The country produces a variety of crops, some of which are yams, grains, cocoa, oil palms, kola nuts, and timber. Livestock rearing and alternative livelihood (grasscutter, rabbits, snail and bee farming, among others) have gained prominence in recent times.

The drop in commodity prices in the late 1960s heralded a consistent underperformance by the sector. Since then, farmers have been faced with fewer incentives to produce also because of a general deterioration of the necessary infrastructure and services. Farmers have also had to deal with increasingly expensive inputs, such as fertilizer, because of the overvaluation of the cedi. Food production has fallen as well, with a decline in the food self-sufficiency ratio from 83 percent in 1961-66 to 71 percent in 1978-80, coupled with a four-fold increase in food imports in the decade prior to 1982. By 1983, when drought hit the country, food shortages were widespread, and export crop production reached an all-time low.

When the government initiated the first phase of the Economic Recovery Programme (ERP) in 1984, agriculture was identified as the economic sector that could rescue Ghana from economic decline. Accordingly, since that time, government has invested significant funds in the rehabilitation of agriculture with the implementation of specific projects aimed at increasing cocoa yields and developing the timber industry. The spraying of cocoa farms with pesticides in the early 2000s resulted in record harvests of 736,629mt and 740,458mt in the 2003/2004 and 2005/2006 seasons⁹². In spite of all the efforts towards improving agricultural productivity, the country is still not food self-sufficient, because greater attention has been paid to improving the country's balance-of-payments position rather than achieving food self-sufficiency. In particular, industrial tree crops such as cocoa, coffee, and oil palm seedlings were singled out for assistance. Clearly, agricultural sectors that could not produce foreign exchange earnings were assigned a lower priority under the reforms.

Agriculture accounts for more than 55 percent of all employment in Sierra Leone and nearly half of its GDP. Agricultural mainstays include rice, millet, tomatoes, cassava, and cash crops such as cocoa and coffee. In the 1970s, the sector accounted for 31 percent of GDP, increasing to about 45 percent in the 1990s. Unfavourable macroeconomic policies in the 1980s affected the sector adversely. This was exacerbated by the civil war of the 1990s, leading to an estimated 40 percent drop in rice production and stagnation of the production of other staples. The instability also led to a 70 percent decline in the output of exports, and over 90 percent of cattle were either killed or transferred to neighbouring countries⁹³. The fisheries sector was not spared either, with production falling to 50 percent of pre-war levels.

⁹² Government of Ghana (2007).

⁹³ Government of the Republic of Sierra Leone (2005).

Post-war agriculture in Sierra Leone has picked up, with a 65 percent increase in cassava production and a doubling of paddy to 422,000mt in 2001/2002. The fishing sector also seems to be doing well, with foreign vessels and local canoes engaged in fresh water harvests. However, the output of cash crops such as cocoa, coffee, kola nuts and oil palm has remained low owing to poor maintenance, (Government of Sierra Leone, 2005). The livestock sector is also plagued with high mortality rates due to food deficiencies and unhealthy farming practices.

In The Gambia, the agricultural sector is dominated by peanut production, which accounts for 5.3 percent of GDP. Agriculture on the whole, accounted for 33 percent of GDP in 2006 and employed about 65 percent of the workforce by 1993, (WDI, 2008). The livestock sub-sector accounts for 4.4 percent, with fishing at 1.8 percent and forestry at 0.5 percent of the sector. Similarly, agriculture is the number one employer in Guinea, employing some 76 percent of the active workforce as of 1994. The country is noted for bananas, pineapples, coffee, peanuts and oil palm exports. However, agriculture is not the number one foreign exchange earner, as evidenced in Table 3.9.

The Industrial Sector

Shortly after independence, the countries within the WAMZ pursued catch-up industrialization policies with the aim of mimicking the growth pattern of the industrialized world by investing massively in state-of-the-art technology from Western Europe, the United States and Russia. This was to set the tone for industrialization. However, like many other sub-Saharan African countries, this was done to the neglect of already existing industries. The initial industrialization drive failed partly because such key infrastructure – such as electricity, water and communication systems – which facilitate the efficient running of some of the procured

equipment, were not reliably supplied. Furthermore, some of the procured equipment were so sophisticated that they could not be efficiently managed by the local workforce, so expatriates had to be employed to handle them. The required inputs had to be imported as well, further increasing the cost of production as well as the import bill.

Table 3.9 Structure of WAMZ Merchandise Exports and Imports

Country	Food		Agricultural Raw Materials		Fuels		Ores and Metals		Manufactures	
	% of total		% of total		% of total		% of total		% of total	
	1995	2006	1995	2006	1995	2006	1995	2006	1995	2006
Exports										
Gambia, The	60	81	1	4	0	..	1	1	36	14
Ghana	58	61	15	4	5	1	9	3	13	31
Guinea	8	..	1	..	0	..	67	..	24	..
Nigeria	2	..	2	..	96	..	0	..	1	..
Sierra Leone										
Imports										
Gambia, The	36	31	1	2	14	17	0	1	46	49
Ghana	8	13	1	1	6	14	0	1	77	70
Guinea	31	..	1	..	19	..	1	..	47	..
Nigeria	18	..	1	..	1	..	2	..	77	..
Sierra Leone										

Source: World Bank's World Development Indicators CD-ROM (2008)

The oil sector has made Nigeria the United States' number one trading partner on the African continent. Nigeria discovered oil in 1956, but it was not until after the civil war in 1970 that the oil revenue began to have an impact on the economy. With the benefit of a relatively organized and unified federal government in place, the nation began to make good use of the oil windfall earnings of the early 1970s. The construction sector benefitted from new road and bridge construction contracts as part of a US\$20 billion expenditure package put in place by the government. However, the sector has been hampered by capacity under-utilization of late due mainly to the security problems in the Niger Delta area, where most of the oil is produced. The

country also boasts a large reserve of Liquefied Natural Gas (LNG), which is expected to overtake the oil sector as the single most important foreign exchange earner if properly managed.

The country embarked on an import-substitution industrialization drive that saw the indigenes acquiring majority stakes in companies in the manufacturing sector in the mid-to-late 1970s, while many consumer-based industries were established later on. In a bid to further boost the industrial sector, which accounted for about 22 percent of employment in 1995 (WDI, 2008), the country invited many automobile companies to establish production plants there. Leyland, Peugeot, Volkswagen, Fiat and Daimler-Benz were among those that responded to the call. The clothing and textiles industry has dominated the manufacturing sub-sector, but it also has its domestic demand problems with most people preferring to buy imported clothing.

Shortly after independence in Ghana, the government sought a rapid industrialization strategy to improve the lives of Ghanaians. Thus, Ghana adopted an all-out industrialization strategy as its main policy thrust with the importation of complete plants for the establishment and operation of industries. The focus was on the development of large scale, capital-intensive manufacturing industries owned and managed by the state. The industries were protected from foreign competition through a restrictive trade policy regime complemented by an array of subsidies serving as incentives. This was a move towards economic independence to buttress the political independence that had been achieved.

This strategy led to rapid economic growth for most of the 1960s, culminating in a near 90 percent growth in manufacturing employment, (Asenso, 2007). However, by the end of the 1970s, industrial growth had taken a downward trend. The country experienced significant de-industrialization in the 1970s and early part of the 1980s as a result of its inability to sustain the initial growth engineered by the manufacturing sub-sector. In addition to this, the sector had been

bogged by a myriad of problems such as the overvaluation of the cedi, price and import controls, amongst others, resulting in high costs of production.

The ERP and post-ERP period saw the privatization of many SOEs in a bid to cut waste and abolish government subsidies. Import quotas were abolished, most tariffs were revised downwards, exchange rates were rationalized and the regulatory framework streamlined. This period also saw the liberalization of trade, leading to an influx of manufactures, which in turn caused the collapse of many industries due to their inability to compete favourably with such goods. According to Aryeetey *et al* (2000), “The major difference between industrial policy before and after 1983 is the macroeconomic policy and trade regime within which economic agents in the sector operate. In both periods industrial policy suffered from a lack of sector specificity. Assistance to the manufacturing sector has been thematic rather than sector-specific.”

The discovery of oil in July 2007 is expected to change the structure of Ghana’s industrial sector in the not too distant future. Production of the confirmed 1.6 billion barrels out of a projected reserve of about 27 billion barrels is expected to commence in the last quarter of 2010, with an initial output of 120,000 barrels per day.

The Gambia has a horde of small-scale manufacturing industries, most of which are agriculture-fed. These industries process peanuts, fish and hides. Like the other countries in the region, heavy industrial activity is infinitesimally small. On the whole, the industrial sector accounted for about 6.1 percent of employment in The Gambia by 1993, (WDI, 2008). Guinea, on the other hand, receives a large chunk of its revenue from extractive industries that are engaged in the production of diamond, gold, iron ore, uranium and bauxites. The country, which has approximately 5.9 percent of its workforce in the industrial sector (WDI, 2008), is thought to possess up to a half of the world’s bauxite reserves. The mining sector has seen massive

investments owing to its potential. Likewise, Sierra Leone is better known for its diamond exports. A civil war which lasted more than a decade crippled the diamond sector such that the diamonds were labeled as “blood diamonds” due to their role in perpetuating the war. Apart from diamonds, the country also boasts large rutile (one of the largest reserves in the world) and bauxite deposits. In addition to this, it has small scale industries which engage in the processing of some farm produce.

The Services Sector

The services sector in the WAMZ (check Appendix 2 for the structure of services exports), which is largely dominated by Nigeria, has seen a massive lift since the turn of the century. The sector accounted for 27.8 percent of all employment in The Gambia in 1993. By 1999, the sector had increased its share of employment in Ghana to 31.1 percent from the 1984 figure of 26.1 percent. And in Guinea, the sector accounted for 18.1 percent of employment by 1994.

Following from the IMF/World Bank sponsored financial sector reforms, the financial sector has become more active than before. Many banks in the region have been recapitalized and many foreign exchange bureaus have sprung up since the reforms. Since a consolidation policy was implemented by the central bank, banks in Nigeria have grown in financial strength. This has led to many Nigerian banks establishing branches in Ghana, The Gambia and Sierra Leone. As of January 2009, five Nigerian banks had branches outside of Africa.

Aside from banking, the communications sector has also seen a remarkable improvement. The limited supply of landlines has given impetus to mobile telephony in the WAMZ. Regional communications giants have invested across borders and have made in-roads in those countries.

Nigeria has been touted as having one of the fastest growing telecommunications market in the world with some indigenous Nigerian private telecommunications giants investing across the WAMZ borders.

The travel sector has gained prominence in recent times. The sector accounted for 70.8, 76.3 and 82.1 percent of all commercial service exports in The Gambia, Ghana and Sierra Leone respectively in 2005. The Gambia, described as the destination of choice for many Western tourists who travel to the African continent, has rebounded from the decline in the tourism industry after the 1994 military intervention, which repressed the performance of the sector. With a services sector that accounts for 54 percent of GDP, tourism has in recent times become the driving force in the services sector. The country has also garnered a lot of revenue from re-exports trade owing to its low import duties and minimal port restrictions.

It is noteworthy that the services sector of the WAMZ is composed of a huge informal sector which is mainly engaged in retail trade. Most of the people in this bracket are usually unaccounted for since there are hardly any records on them. As a result, it is usually said that the services sector in the WAMZ and the entire sub-Saharan Africa is underestimated since a majority of junior and senior high school drop-outs find their way into this sector. If this was accounted for, the services sector could account for a greater percentage of all employment than is currently attributed to it by available statistics.

3.3.3 The WAMZ: Macroeconomic Performance and Status of Convergence

Hitherto, the macroeconomic environment within the WAMZ had been one characterized by low growth, real exchange rate volatility and high inflation rates owing to both internal and external factors. The fragileness of the macroeconomic environment peaked in the 1970s and

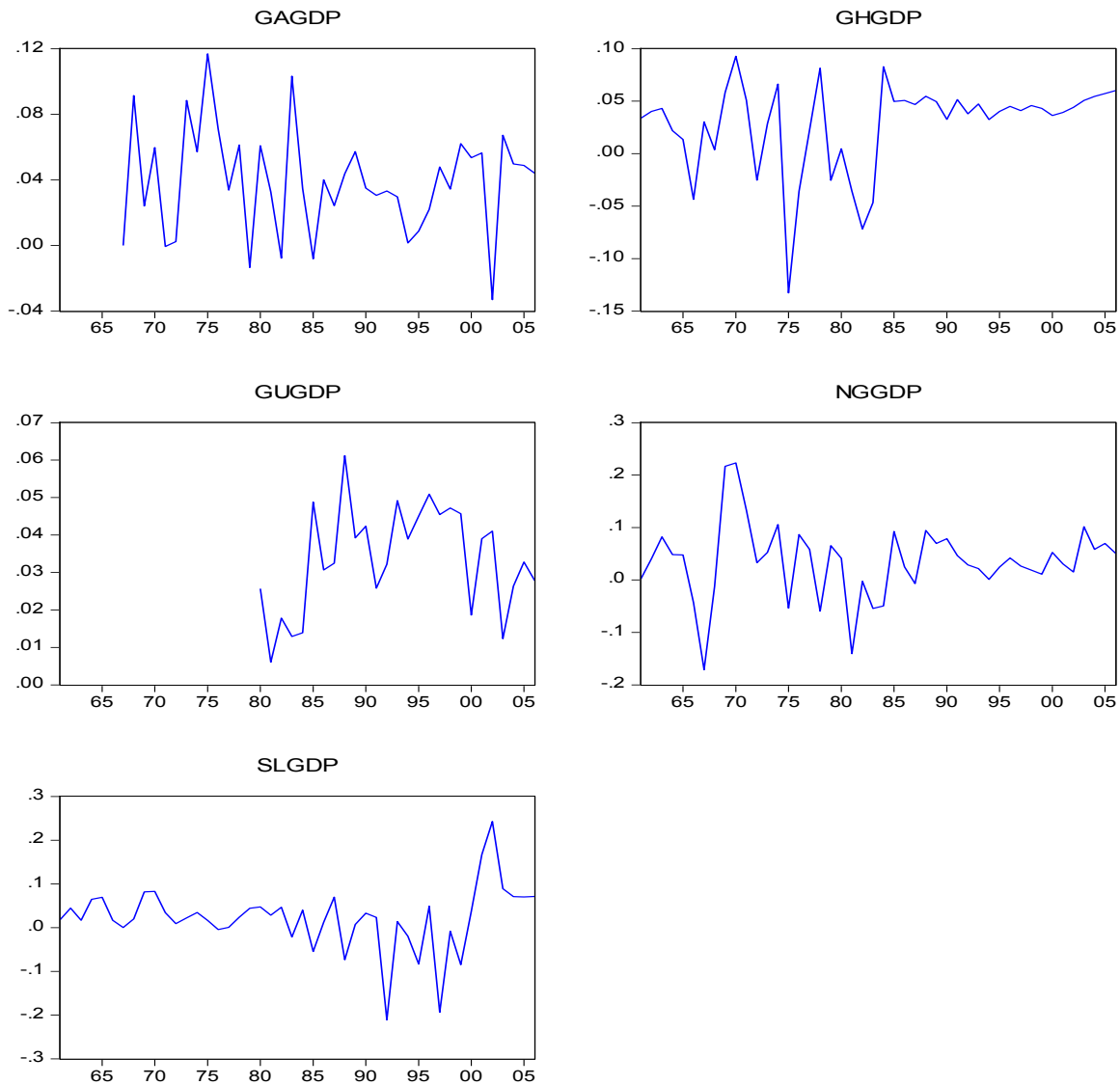
1980s until the reforms. This was exacerbated by deficit financing, due to large fiscal deficits, smuggling and commodity price shocks. The proceeding sub-sections mainly discuss the situation in the WAMZ since December 2000.

Macroeconomic Performance

Macroeconomic performance within the Zone has improved since the commencement of the WAMZ in 2001. With the help of the IMF, World Bank and other development partners – which offered debt cancellations through the HIPC initiative and assisted the countries to develop their own Poverty Reduction Strategy Papers (PRSPs) – resource inflows, favourable commodity prices and a stronger desire to ensure fiscal discipline, the GDP growth within the Zone has improved since the turn of 2000, as indicated in Figure 3.4 and Table 3.11.

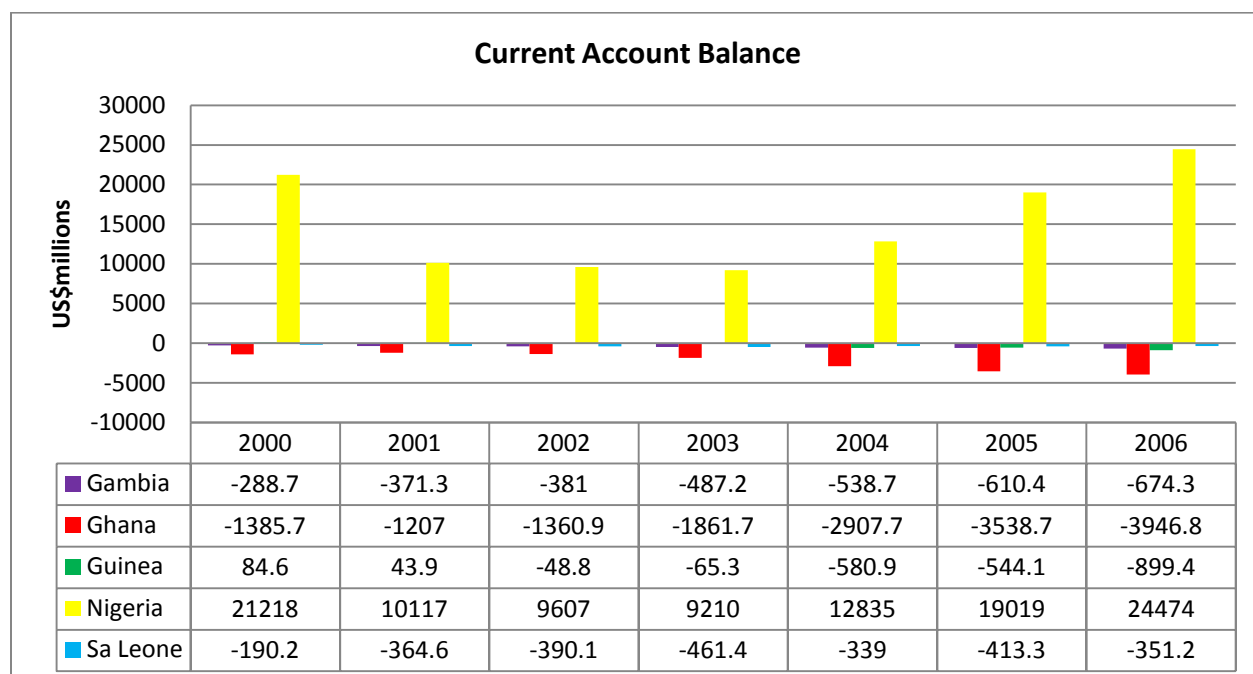
Nigeria's economy grew at 6.51 percent in 2006, up from 5.6 percent in 2005, with the non-oil sector chalking a growth of 8.9 percent and the oil sector recording -4.7 percent, resulting from production cuts due mainly to the trouble in the Niger Delta. The Gambia, on the other hand, grew at 7.7 percent over the same period as a result of a good harvest and a buoyant tourism season. Ghana, over the same period, grew at 6.2 percent with Sierra Leone and Guinea (which seems to be dragging along) recording 7.5 percent and 2.82 percent growth respectively.

Figure 3.4 Trends in WAMZ GDP Growth



Generally speaking, the countries are performing badly on the score of current account balance as indicated in Figure 3.5. Even though commodity prices have been increasing, thus, resulting in windfall revenues, the import bill has also been on the increase. This has tripled the current account deficit of most countries since 2000, apart from Nigeria which runs a current account surplus. In fact, in Guinea, the current account deficit in 2006 was more than ten times higher than the 2000 figure.

Figure 3.5 WAMZ Current Account Balance



Source: Calculated from the Direction of Trade Statistics CD-ROM (2009)

Apart from The Gambia and Guinea, the other countries have experienced significant reductions in the rate of depreciation of their currencies against the US dollar. Between 1995 and 2000, the Nigerian naira, Ghana's cedi and the Sierra Leonean leone depreciated by 55.26 percent, 36.61 percent and 24.65 percent respectively. By 2001-2006, this had reduced to 5.78 percent, 26.91 percent and 8.83 percent respectively⁹⁴. Although favourable commodity prices and debt relief played a role in ensuring this, the impact of the efforts to meet the convergence criteria cannot be ignored. Table 3.10 portrays the situation within the Zone in 2006.

⁹⁴ Full details in Appendix 5A.

Table 3.10 Developments on WAMZ Macroeconomic Indicators as of December 2006

Country	Inflation	Exchange Rate to US\$1	External Reserves (US\$ million)	Growth in Base Money	Growth in Money Supply (M2)
The Gambia	1.4	28.05	101.5	24.3	26.2
Ghana	10.5	9,235.30	2,266.7	32.3	39.4
Guinea	39.1	5,650.00	83.3	81.3	58.2
Nigeria	8.5	127.00	41,959.0	20.5	30.9
Sierra Leone	8.3	2,973.94	172.66	10.73	21.5

Source: West African Monetary Institute (2007)

Status of Convergence

The issuance of the eco has been postponed three times owing to the WAMZ members' inability to meet all the convergence criteria. As stated earlier, the set of convergence criteria is aimed at ensuring macroeconomic convergence and assuring themselves and the international community of their commitment to the adherence to strict monetary and fiscal discipline. At the initial stages, it seemed quite difficult for the countries to refrain from deficit financing, meet the foreign exchange reserves requirement and lower fiscal deficit in accordance with the primary criteria. However, with time, the countries have made progress but still have a lot of work to do. It is obvious that macroeconomic indicators have turned positive since the commencement of the WAMZ in 2001, as indicated by Table 3.11.

Table 3.11 Economic Trends of WAMZ

	Inflation	Real GDP Growth	Government Balance	Current Account	Export Growth
1970-79	14.6	3.4	-4.8	-1.9	1.6
1980-89	30.5	1.7	-4.9	-4.5	2.0
1990-99	18.7	1.4	-3.7	-4.5	6.9
2000-06	10.2	4.9	-2.6	-3.5	5.1

Source: Gulde (2008)

On the average, the countries managed to meet three of the four criteria in 2005 and repeated the performance in 2006. As indicated in Table 3.12, the bogey criterion has been the achievement of a single digit inflation, which has been achieved by some countries but not others. On a zonal basis, all the primary criteria, except inflation, have been met consistently since 2001, except in 2003, (WAMI, 2007).

Table 3.12 Status of WAMZ Convergence Criteria as of December 2006

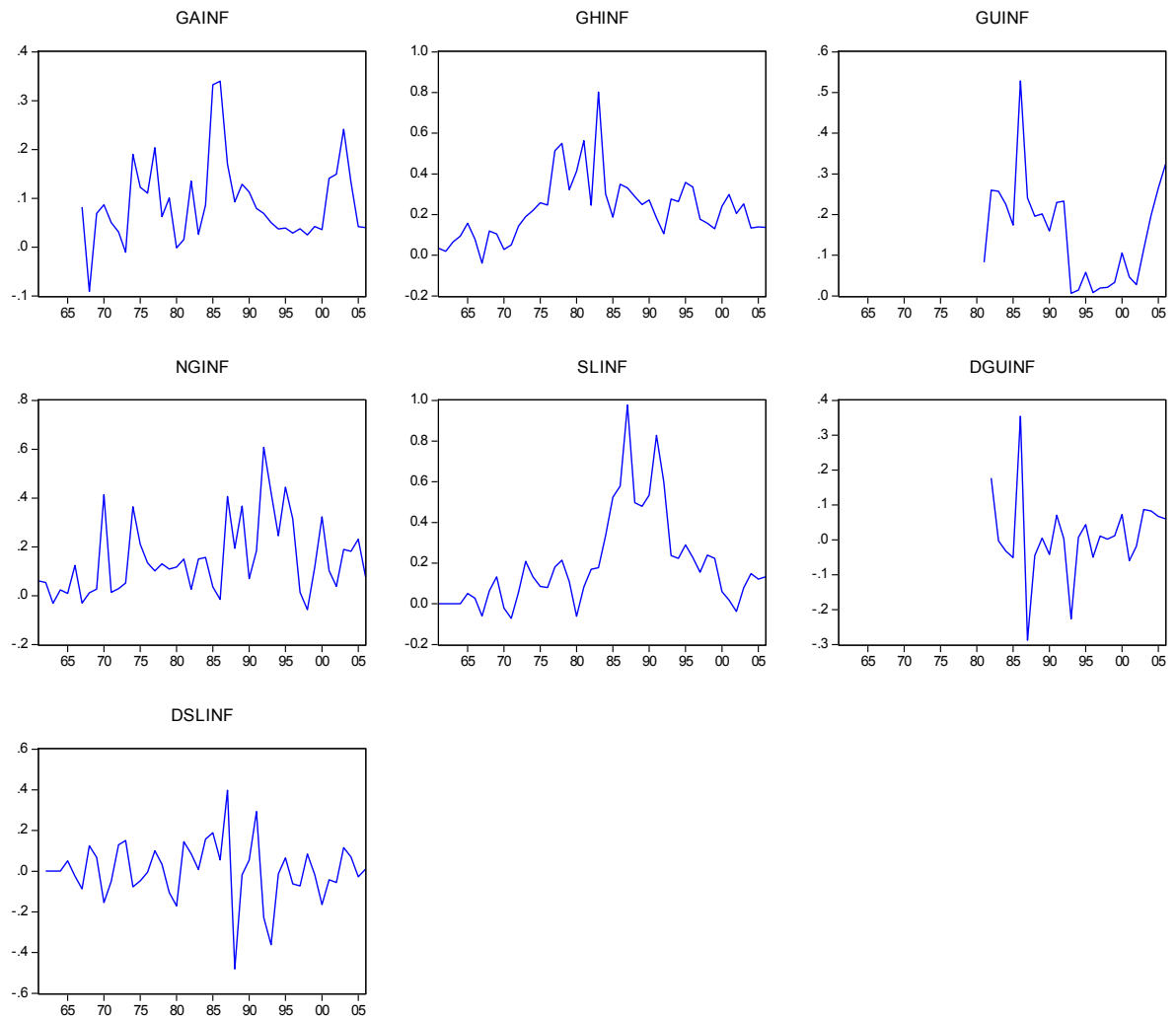
Primary Criteria	Target	2005	2006
Inflation Rate (end of period)	Single Digit	13.4	11.5
Fiscal Deficit/GDP excl. grants	4%	1.7%	1.3%
Central Bank Financing of fiscal deficit as % of previous years' tax revenue	<10%	0.0%	0.0%
Gross External Reserves (Months of Imports)	3	13.2	20.3
Criteria Satisfied		3	3

Source: West African Monetary Institute (2007)

Even though the average inflation rate decreased from 13.4 percent in 2005 to 11.5 percent in 2006, it still failed to meet the single digit target set for the Zone, with Ghana (10.5 percent) and Guinea (39.1 percent) dragging the Zone down. This is not a recent phenomenon, as

the countries have struggled with containing inflation for a very long time, as indicated in Figure 3.6.

Figure 3.6 Inflation (Change in GDP Deflator) in WAMZ



On the budget deficit-to-GDP ratio, the Zone once again exceeded expectations by achieving a rate of 1.3 percent, which is well within the 4 percent threshold. According to the WAMI (2007), the performance was largely driven by Nigeria's performance, but was also influenced by the other countries' desire to ensure fiscal discipline.

It is heartwarming to note that the WAMZ countries have departed from “the printing press regime.” This means that even without a common central bank, the countries seem to have consistently complied with not asking the central bank to finance fiscal deficits. Many people have expressed doubt that this feat would be achieved this soon. But there is still a cause for alarm since governments have used domestic and externally borrowed funds to finance the increasing fiscal expenditure in recent years. On another positive note, the gross reserves of the Zone could finance 20.3 months of imports at the end of December 2006, but the WAMI attributed this largely to Nigeria’s windfall oil revenue. Even though the oil price increases had a negative impact on the four other countries, this was mitigated by the generally high prices of gold, cocoa and some of the other export commodities within the Zone.

3.3.4 Intra-WAMZ Trade

One of the advantages of monetary unions is the deepening of intra-regional trade that comes mainly as a result of the reduction in transaction costs. The use of a single currency gets rid of the cost, in both time and money, of converting one currency into another in order to engage in trade – and for a region whose currencies are not convertible, this is welcome news. Currency inconvertibility has the tendency of discouraging regional trade, especially if there are alternative destinations like the WAEMU for the WAMZ countries. The CFA franc is accepted in eight ECOWAS countries, so receiving payments in CFA francs would not be too difficult to accept as compared to receiving the Nigerian naira, for example. A single currency, therefore, promotes trade not just for the countries within the region, but also other countries that trade with some of the countries in the region.

The positive impact of monetary unions on trade has been confirmed by many authors following from Rose's (2000) groundbreaking study. However, the maximization of the transaction costs reprieve is largely dependent on the extent of trade within the region. If countries do not to trade more with each other because regional supply does not meet regional demand very little can be achieved in terms of savings on transaction costs.

Nigeria is the number one exporter of merchandise meant for both within and without the Zone, but its WAMZ exports are heavily tilted towards one country – Ghana and to some extent, Guinea. As can be inferred from Table 3.14, Nigeria exported an average of 1.89 percent (i.e. 13.24 percent of Ghana's total imports) of its total merchandise to Ghana and 0.02 percent to Guinea between 2000 and 2006. Ghana, on the other hand, is the largest importer of WAMZ commodities and has the highest overall trade share within the WAMZ. But a greater chunk of its regional imports is oil-based and emanate from Nigeria. Trade within the region is in the hands of these two countries, which jointly held 99.05 percent of regional trade in 2006, with Ghana accounting for approximately 51.64 percent, as can be seen from Table 3.13.

Table 3.13 Percentage Share of Intra-WAMZ Trade

	2000	2001	2002	2003	2004	2005	2006
Gambia	0.34	0.24	0.19	0.20	0.21	0.18	0.18
Ghana	50.01	50.88	50.20	50.59	51.57	51.65	51.64
Guinea	1.11	0.44	1.88	0.39	0.60	0.55	0.55
Nigeria	47.87	48.20	47.56	48.57	47.35	47.39	47.41
Sa Leone	0.68	0.25	0.18	0.25	0.27	0.23	0.23

Source: Calculated from the Direction of Trade Statistics Yearbook (2007)

From Table 3.8, it is obvious that all countries within the Zone are exporters of primary commodities and importers of capital and manufactured goods. Those that are engaged in the export of agricultural commodities specialize in the production of cash crops such as cocoa, cotton and coffee – commodities which are not in high demand in the region. This, in part, has

contributed to the low bilateral trade among the countries in the region since very little of manufactures, which seem to dominate imports, are produced within the region, thus, countries have to import them from outside the region. The table below gives a fair representation of bilateral trade as a percentage of the exporting countries' total exports (first half) and as a percentage of the importing countries' total imports (second half) within the region⁹⁵.

Table 3.14 Shares of Bilateral Exports and Imports in WAMZ

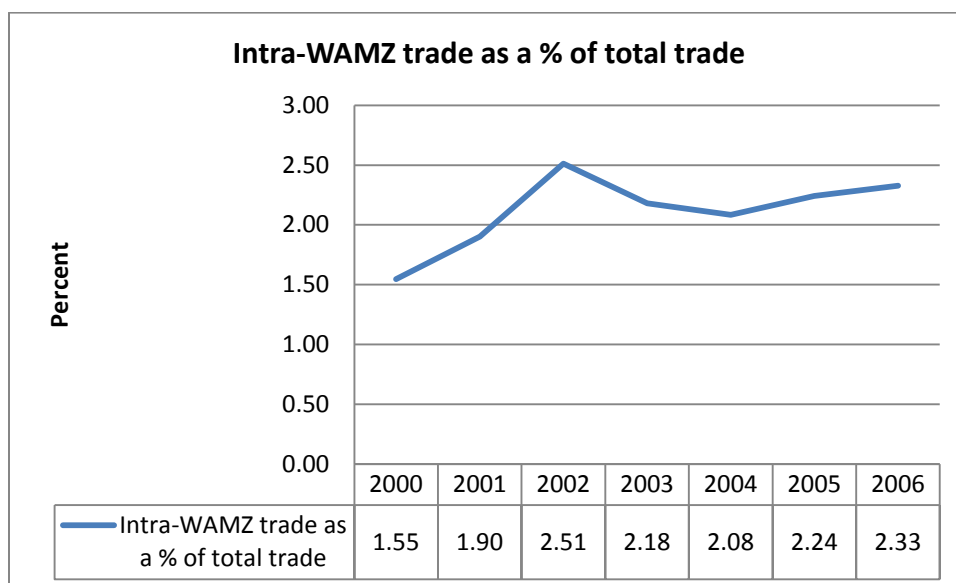
Exports 2000-2006					
	Gambia	Ghana	Guinea	Nigeria	Sa Leone
Gambia	0	0.94	0.47	0.18	1.05
Ghana	0.07	0	0.03	1.09	0.07
Guinea	0.01	0.01	0	0.10	1.46
Nigeria	0.00	1.89	0.02	0	0.00
Sa Leone	0.35	0.00	0.56	0.22	0
Imports 2000-2006					
	Gambia	Ghana	Guinea	Nigeria	Sa Leone
Gambia	0	0.01	0.01	0.00	0.01
Ghana	0.42	0	0.01	0.17	0.05
Guinea	0.01	0.00	0	0.06	0.36
Nigeria	0.00	13.24	0.40	0	0.00
Sa Leone	0.09	0.00	0.11	0.00	0

Source: Calculated from the Direction of Trade Statistics Yearbook (2007)

The ever-increasing import bill requires that countries within the Zone export more to countries with hard currencies in order to be able to finance such demand. And since the WAMA has failed to bring about savings on foreign exchange, trade within the region is still largely conducted in foreign currency (notably the US dollar and recently, the euro). This has also contributed towards repressing intra-regional trade. Given the few intra-regional trade opportunities that exist, the low prices of traded commodities (mainly foodstuffs) and the relatively expensive nature of imported commodities, WAMZ intra-regional trade has and continues to be almost insignificant, as portrayed by Figure 3.7.

⁹⁵ A fuller account on intra-WAMZ trade can be found in Appendix 3.

Figure 3.7 Total Intra-WAMZ Trade as a Percentage of Total Trade



Source: Calculated from the Direction of Trade Statistics Yearbook (2007)

As of 2006, recorded intra-WAMZ trade was around 2.33 percent of its total trade. This is largely attributable to the fact that most of their export commodities are not needed very much in the sub-region. The nature of merchandise exports and imports means that these countries will continue to have minimum trade amongst themselves unless their industrial and export structures are made to adapt to regional demand.

Geography too could be a factor. The WAMZ countries are geographically disjointed, with Guinea and Sierra Leone being the only direct neighbours⁹⁶. It is only natural that countries would trade more with their closest neighbours, since it is cost-effective, in view of the region's inefficient transportation systems and corrupt security officers at police and customs check points. The farther one goes, the more bribes one would expect to pay. For instance, Nigeria trades more with Cameroon, Benin and Niger than with its fellow WAMZ members partly because they are direct neighbours. The same goes for Ghana, Burkina Faso, Togo (and Benin as

⁹⁶ Refer to the graph in Appendix 4C.

well) and Côte D'Ivoire. The Gambia has a relatively significant trade relationship with Senegal (and by extension, Guinea-Bissau). So does Guinea on one hand, and Senegal and Mali on the other. This same border effect is what has ensured that trade, according to WAMZ standards, is high between Sierra Leone and Guinea. But this is not to suggest that the border effect is the only cause of this phenomenon, because Ghana trades more with Angola (which is in southern Africa) than with any of the other WAMZ countries, and Guinea trades extensively with Morocco (in North Africa). In addition, all the WAMZ countries, except Nigeria, run a trade deficit with South Africa – mainly due to its superior industrial capacity.

Another reason for the low trade in the WAMZ is the small-size nature of the economies within the Zone. Because of low income levels, the use of outdated technology and low consumption capacity, the countries within the Zone are unable to produce high quality goods for exports and import regional commodities for processing. For instance, the consumption of petroleum products within the region is quite low and as such, Nigeria, aside from its existing trade commitments, would not have been able to find a significant market for its oil within the WAMZ. That is why apart from Ghana, it turns its attention to South Africa and Côte D'Ivoire to sell its products. Moreover, since the WAMZ is not a customs union, there is little incentive to turn to WAMZ members for certain manufactured goods (if they exist at all). This has given a leeway to foreign competitors to flood the markets with their goods to the detriment of local industries.

As if this is not enough, trade within the WAMZ could be taking a nose-dive due to the discovery of oil in Ghana and the likely discovery of oil in the other countries⁹⁷. This could significantly reduce the volume of trade between Ghana and Nigeria (which is the highest within

⁹⁷ The other countries are vigorously expanding their oil exploration, stemming from heightened speculation that the West African coast has huge deposits of oil.

the region) and possibly between Nigeria and the others. But on the brighter side, it could move the countries towards achieving symmetric terms of trade shocks as well as common industrial shocks – which would facilitate the use of a single monetary policy in the Zone. As it stands now, the correlations⁹⁸ of the terms of trade paint a bleak picture for the WAMZ, as indicated in the table below⁹⁹.

Table 3.15 Descriptive Statistics and Correlation of WAMZ Terms of Trade Growth

Descriptive Statistics of TOT Growth			Correlation of TOT Growth			
	Mean	Standard Deviation	Gambia	Ghana	Guinea	Nigeria
Gambia	-0.03	0.09	1			
Ghana	-0.02	0.14	0.14	1		
Guinea	0.02	0.15	-0.37	0.02	1	
Nigeria	-0.004	0.25	-0.22	-0.22	0.32	1

Source: Calculated from the World Development Indicators CD-ROM (2008)

There are no significant correlations among the countries' terms of trade growth. But it is very worrying to note that the correlations between The Gambia and Guinea as well as The Gambia and Nigeria are negative, though insignificant. Indeed, the correlations between their terms of trade at levels (in Appendix 6) turn out to be negative and significant. This could mean that they experience dissimilar terms of trade shocks. Nigeria's terms of trade happens to be the most volatile in the region, as indicated by the high standard deviation.

3.3.5 Prospects of the Monetary Zone

As discussed earlier, the prospects of any monetary union look promising as long as the countries involved constitute an optimum currency area. As a precursor to estimating the various shocks (to determine whether the WAMZ constitutes an OCA), the descriptive statics of the variables and their correlations are presented. The means and the standard deviations of GDP

⁹⁸ The Pearson's correlation coefficient is used here and for all other correlation tests in the study.

⁹⁹ Data on Sierra Leone was not available in the WDI.

growth (measured by the change in the logarithm of real output), inflation (measured by the change in the logarithm of the GDP deflator), nominal and real money supply and the real exchange rates for all the five countries are analyzed in this section.

Table 3.16 WAMZ Real GDP Growth and Inflation Statistics

Country	Growth		Inflation	
	Mean	Standard Deviation	Mean	Standard Deviation
Gambia	0.04	0.03	0.09	0.09
Ghana	0.03	0.04	0.22	0.16
Guinea	0.03	0.01	0.15	0.13
Nigeria	0.03	0.07	0.15	0.15
Sa Leone	0.02	0.07	0.20	0.23

Source: Calculated from the World Development Indicators CD-ROM (2008)

Generally, the data used spanned 1960-2006¹⁰⁰ with data on Guinea running from 1979-2006, and The Gambia, from 1965¹⁰¹. Table 3.16 depicts the general low growth levels that have characterized the region, with the highest average growth of approximately 4 percent being recorded by The Gambia. Sierra Leone and Nigeria jointly exhibit the highest volatility of 7 percent. The over-reliance on rain-fed agriculture has ensured that the weather pattern has more or less dictated the volume of agricultural harvests over the years. Periods of drought have led to low growth and vice versa, especially in Ghana and The Gambia. In the case of Nigeria, the low average growth could be seen as a result of the unpredictable nature of crude oil prices. As expected, average inflation exceeds average growth, with Ghana at the top with an average of 22 percent and The Gambia, with the least inflation, coming through with a 9 percent average. Inflation in the region is also highly volatile. Sierra Leone records the highest volatility in the region followed by Ghana. The corresponding correlation coefficients are presented below.

¹⁰⁰ Except for data on the terms of trade which was from 1980 to 2006.

¹⁰¹ There was no significant change when an equal sample, 1980-2006, was used.

Table 3.17 Correlation of WAMZ Growth and Inflation

	GDP Correlations					Inflation Correlations				
	Ga	Gh	Gu	Ng	SL	Ga	Gh	Gu	Ng	SL
Gambia	1					1				
Ghana	-0.04	1				-0.11	1			
Guinea	-0.30	0.44*	1			0.46*	0.08	1		
Nigeria	-0.02	0.52**	0.48*	1		-0.28	0.01	-0.11	1	
Sa Leone	-0.16	0.01	-0.26	-0.01	1	0.31	-0.06	0.44*	0.28	1

Source: Calculated from the World Development Indicators CD-ROM (2008)

*Correlation is significant at 0.05 level (2-tailed).

**Correlation is significant at 0.01 level (2-tailed).

The correlation coefficient of real GDP growth, in Table 3.17, establishes a strong relationship between Ghana and Nigeria, Ghana and Guinea as well as Nigeria and Guinea. The coefficient of 0.52 between Ghana and Nigeria is statistically significant at the 1 percent level, with the relationship between Ghana and Guinea (0.44) being established at the 5 percent significance level. The one between Nigeria and Guinea (0.48) is established at the 5 percent level. Though insignificant, The Gambia's GDP growth seems to be negatively correlated with those of the WAMZ countries, as was the case with the terms of trade correlations. The story is a little bit different when it comes to inflation. There are positive and statistically significant correlations between Sierra Leone and Guinea (0.44) and The Gambia and Guinea (0.46). This presents a different grouping from the one by the real GDP growth coefficients, but it suggests that Guinea might be better integrated in the WAMZ than all the other countries. However, at this point, nothing is conclusive yet.

Table 3.18 WAMZ Real Money Supply and Real Exchange Rate Growth

	Growth of Real Money Supply		Growth of Real Exchange Rate	
	Mean	Standard Deviation	Mean	Standard Deviation
Gambia	0.08	0.08	-0.02	0.11
Ghana	0.08	0.12	-0.02	0.26
Guinea	0.20	0.85	0.06	0.44
Nigeria	0.04	0.15	-0.04	0.28
Sa Leone	0.02	0.18	-0.02	0.17

Source: Calculated from the World Development Indicators CD-ROM (2008)

A pattern emerges between the growth of nominal money supply¹⁰² and inflation, further giving credence to the popular monetarist theory that inflation is a monetary phenomenon. Ghana's high average inflation is buttressed by a high average nominal money supply growth, followed by Sierra Leone and Nigeria in that order. Guinea's nominal money supply growth is the most volatile within the Zone followed by that of Ghana. But on average, the growth of real money supply in Guinea is highest (this could be due to the relatively fewer observations) followed by those of The Gambia and Ghana, with Guinea exhibiting the highest volatility. However, the growth of nominal money supply correlations established only a single positive and significant relationship (though low) between Sierra Leone and The Gambia, and the growth of real money supply in Table 3.19 established a single correlation between The Gambia and Guinea.

¹⁰² Results of the descriptive statistics and correlations of both nominal money supply growth and real exchange rate (at levels) are presented in Appendix 5B and 5C.

Table 3.19 Correlation of WAMZ Real Money Supply and Real Exchange Rate

	Growth of Real Money Supply					Growth of Real Exchange Rate				
	Ga	Gh	Gu	Ng	SL	Ga	Gh	Gu	Ng	SL
Gambia	1					1				
Ghana	0.40	1				0.23	1			
Guinea	0.54*	0.27	1			0.41*	0.01	1		
Nigeria	0.08	-0.04	0.01	1		0.11	0.01	0.40*	1	
Sa Leone	0.22	-0.23	-0.28	0.25	1	0.37 ^c	0.06	0.52**	0.19	1

Source: Calculated from the World Development Indicators CD-ROM (2008)

^c means significant at the 10 percent level. The other interpretations remain the same.

On the other hand, there exist positive and statistically significant real exchange rate¹⁰³ growth correlations between Guinea and The Gambia, The Gambia and Sierra Leone, Nigeria and Guinea and Sierra Leone and Guinea. From Table 3.18, it can be seen that Guinea's real exchange rate growth emerges as the most volatile in the region, followed by Nigeria's.

3.3.6 Other Integration Issues

Aside from the establishment of institutions (see Appendix 4D (II) for WAMZ institutions) to facilitate the achievement of the monetary union objective, the WAMI, together with all the other stakeholders, is implementing some other measures to ensure a successful transition, as discussed below.

The WAMZ as a Customs Union

As members of the ECOWAS, the WAMZ members have all acceded to all the ECOWAS Protocols bordering on trade. Currently, the WAMZ does not constitute a customs

¹⁰³ All references to nominal and real exchange rates in the study are US dollar-domestic currency rates.

union. However, in line with the Community's Protocols, all the ECOWAS countries are supposed to implement common external tariffs (CET) as follows:

Category 0: Essential social goods and agricultural inputs and equipment	0%
Category 1: Basic raw materials, capital goods and specific agricultural inputs	5%
Category 2: Intermediate products	10%
Category 3: Final consumer goods	20%

Source: WAMI (2007), *WAMZ NEWS*. www.wami-imao.org

The WAEMU members have already implemented the CET but the WAMZ has yet to. In addition to this, the ECOWAS has instituted a 0.5 percent tariff (Togo charges 5 percent while Ghana charges 2 percent) on all non-ECOWAS imports as a means of generating funds for the Community. Thus, at best, the ECOWAS can be said to be a free trade area since goods move freely (at least, most of the time) internally. However, the paltry 0.5 percent external tariff cannot qualify it to be a customs union.

The Single Economic Space Agreement

The WAMI has drafted a Single Economic Space Agreement (SESA) for the WAMZ to further buttress economic integration efforts. Like the EU's version, the SESA seeks to facilitate the movement of goods, services, persons and capital within the WAMZ, as enshrined in the ECOWAS Protocols that accentuate these freedoms. It also prohibits any discrimination against WAMZ citizens on grounds of nationality. Though the ECOWAS Protocols state categorically that there should be no restriction on the movement of goods, services, persons and capital, these are not enforced to the letter since governments, in a bid to ensure the welfare of their own

citizens, have usually acted against the Protocols. Typical examples are the repatriation of over a million Ghanaians from Nigeria in the early 1980s, the enforcement of a minimum capital requirement for foreign business owners in Ghana, which has affected some West African nationals ¹⁰⁴, and Nigeria's imposition of quantitative controls and outright ban on the importation of certain types of goods even from within the West African sub-region.

Harmonization of the Payments System

In a bid to facilitate the transition to the intended single currency, the WAMI in 2001 proposed the harmonization of the payments system within the Zone [see Appendix 4D (IV)]. This is aimed at helping the countries to improve “The efficiency of financial intermediation, the management of systemic risks in the financial systems and liquidity management, monetary policy implementation and the general deepening of the financial systems,” (ADF, 2008). Two countries, Ghana and Nigeria, are already operating the Real Time Gross Settlements (RTGS) systems – a large value funds transfer system whereby financial intermediaries can settle interbank transfers continuously and in real time for their own account as well as the accounts of their customers. The Gambia, Guinea and Sierra Leone have yet to implement it.

The WAMI has secured a US\$23 million grant from the African Development Bank (AfDB) to get these three countries on the RTGS. In a recent interview, the Director of Operations of the WAMI stated that the tender for the consultancy for the project was underway and that the project was on schedule¹⁰⁵.

¹⁰⁴ Nigerians complained of discrimination by Ghanaian authorities. May 6, 2008. *Ghana is not against Nigeria – Kufuor*. www.myjoyonline.com.

¹⁰⁵ December 15, 2008. *Eco Deadline Remains December 2009*. www.myjoyonline.com

Integration of Capital Markets

There are only two stock exchanges in the WAMZ, in Ghana and Nigeria. There are efforts towards integrating the two, including Côte d'Ivoire, through the cross-listing of stocks between the exchanges. The WAMI has thus commissioned a study to assess the feasibility of this objective. Moreover, a series of meetings have been held between the two stock exchanges to see how this can be made possible. The WAMI is also considering the establishment of stock exchanges in the three other countries at a later date.

In the meantime, some companies in the countries that do not have stock exchanges have listed in Ghana and Nigeria. A typical example is the listing of The Trust Bank, The Gambia, on the Ghana Stock Exchange (GSE).

Statistical Harmonization

In response to WAMI's call for the harmonization of economic and financial data by the end of the first quarter of 2002, all members of the WAMZ have now signed up to the IMF's General Data Dissemination Standards (GDDS). The IMF outlines the purposes of the GDDS as to¹⁰⁶:

- a) encourage member countries to improve data quality
- b) provide a framework for evaluating needs for data improvement and setting priorities in the project; and
- c) guide member countries in the dissemination to the public of comprehensive, timely, accessible, and reliable economic, financial, and socio-demographic statistics.

Since signing on to the GDDS, data accessibility within the Zone has improved.

¹⁰⁶ <http://dsbb.imf.org>.

3.3.7 Political Factors

As stated earlier on, the WAMZ project is part of a grand design towards an African monetary union, beginning first with an ECOWAS-wide monetary union. This, like the genesis of the EU, has political undertones rather than economic – even though one of the main objectives is to enhance trade. Unlike the EMCP, WAMZ governments have shown a great deal of support for the single currency initiative, even though they have sometimes reneged on their promises to ensure fiscal consolidation for political expediency. The political commitment on the part of governments, rather than economic ones, is what has brought WAMZ thus far. The political commitment was what propelled ECOWAS countries to establish the ECOWAS Bank (ECOBANK)¹⁰⁷, a Pan-African commercial bank with over 500 branches in more than 25 countries, and the West African Gas Pipeline (WAGP), which has been transmitting LNG from Nigeria through to Benin, Togo and finally, Ghana. In addition, plans are far advanced to merge the two stock exchanges – the Nigeria Stock Exchange (NSE) and the GSE – to facilitate financial integration in the region. But there is another political dimension that ought to be considered.

The peaceful hand-over of power from one political party to another in Sierra Leone in 2007 was seen by many as another milestone in the country's resolve to ensure stability and push through the WAMZ agenda. However, a botched election tainted by violence and rigging in Nigeria in 2007, and a military take-over in Guinea after the demise of a former dictator president in December 2008 have cast doubts on the minds of many as to whether the region is indeed stable enough to sustain a monetary union. But Ghana seems to have revived the hopes of many of its commitment to the tenets of democracy, with the conduct of free and fair elections and a peaceful handover of power to the opposition party. Which way will The Gambia go? The

¹⁰⁷ ECOWAS sought to raise \$2.5billion on the international and local capital markets in 2008 for expansion.

test is whether The Gambia will see a peaceful transition of power from a military-turned-civilian government, as was the case in Ghana in 2000. This has and continues to raise questions about whether the region is committed to maintaining political stability.

3.4 Concluding Remarks

This chapter has looked at the antecedents of the WAMZ. It has revealed that the concept of monetary union is not new to the countries in the WAMZ as all of them have, at one point in time or another, been part of a monetary union, with Guinea belonging to the CFA Zone and The Gambia, Ghana, Nigeria and Sierra Leone belonging to the West African Currency Board before independence, albeit a currency board. The chapter has also discussed the ambitions of the African Economic Community to establish a common central bank and issue a single African currency by 2028.

Furthermore, it discussed two out of the four full monetary unions in the world, the WAEMU and CEMAC, and gave a brief highlight on the CMA and the revived EAC. It delved into discussions bordering on ECOWAS's efforts towards greater economic and monetary integration, bringing to light the rationale for the establishment of the WACH, WAMA and the EMCP, all of which have failed to live up to expectations, thus, prompting a re-think of the process of an ECOWAS-wide monetary union. Consequently, the WAMZ was born to facilitate macroeconomic convergence among the non-WAEMU members of ECOWAS and eventually establish a monetary union which would ultimately be merged with the WAEMU. The second half of the chapter focused on the WAMZ – an overview of its economic structure, the prospects of a monetary union and the mechanisms that have been put in place in order to make it a reality.

To some extent, Guinea seems to be better integrated with the other countries within the Zone, exhibiting more integration tendencies on both real sector and monetary variables scores. It has positive and significant real exchange rate growth correlations with Nigeria and Sierra Leone. It also has positive and significant inflation correlations with The Gambia and Sierra Leone as well as positive and significant GDP growth correlations with Ghana and Nigeria. The Gambia is also better integrated on monetary indices than real sector indices. It has positive and significant real exchange rate correlations with Guinea and Sierra Leone. It also has positive and significant real money supply and inflation correlations with Guinea. But it has negative terms of trade growth correlations with Guinea and Nigeria, though insignificant, and negative GDP correlations with all of the WAMZ. Ghana, on the other hand, has strong real sector integration with the WAMZ. It has positive and significant GDP growth and terms of trade correlations with both Guinea and Nigeria (but the terms of trade growth correlations are insignificant). Sierra Leone has a positive and significant inflation correlation with Guinea. Sierra Leone fares better on monetary variables, with no recorded real sector correlations.

On the whole, despite the low intra-regional trade within the Zone, the WAMZ countries tend to experience co-movements in certain macroeconomic indicators. Ghana, Nigeria and Guinea seem to form a bloc with respect to terms of trade (at levels) and GDP. Since trade is very important in the region, this is a good sign for the countries. However, the findings in this chapter are preliminary and not conclusive on the advisability of monetary unification for the WAMZ.

Chapter Four

Methodology

4. Introduction

This chapter discusses the methodological approach, specification and interpretation of the models that are used in the study. The models distinguish between *ex ante* and *ex post* (or endogeneity) eligibility analyses for monetary unification. The chapter also discusses the use of shocks analysis to test whether the WAMZ qualifies, by OCA standards, to form a monetary union; and the gravity model to ascertain the existence of post monetary union trade enhancement in the WAEMU. It also sets the tone for testing for shocks endogeneity by analyzing the demand and supply shocks of the WAEMU. Finally, it postulates models for ascertaining the plausibility of an exchange rate union, in the short-to-medium term, both as an internal arrangement and also based on an external currency anchor in the event that the monetary union option is not viable.

4.1 Specification of Models

4.1.1 *Ex Ante* Shocks Analysis Methodology

This section of the chapter discusses two variants of the original Blanchard and Quah (1989) methodology, hereafter BQ, which distinguishes between permanent and transitory shocks. Two structural vector autoregressive (SVAR) models are estimated – one involving the decomposition of shocks into demand and supply shocks, as used by Bayoumi and Eichengreen (1994), hereafter BE, and one that decomposes shocks into country-specific, regional and global shocks (as used by Chow and Kim, 2003), hereafter CK.

The model of interest is a vector moving average (VMA) model which is specified as follows:

$$X_t = A_0 \varepsilon_t + A_1 \varepsilon_{t-1} + A_2 \varepsilon_{t-2} + A_3 \varepsilon_{t-3} + \dots \quad (4.1)$$

where X_t is a column vector comprising the natural log-difference of output (Δy_t) and prices (Δp_t), and ε_t represents demand (ε_{dt}) and supply (ε_{st}) shocks which are uncorrelated and have unit variances [i.e. $Var(\varepsilon_t) = I$]. The matrices, A , represent the impulse response functions of Δy_t and Δp_t and are of the form,

$$A(L) = \begin{bmatrix} \sum_{k=0}^{\infty} a_{11}(k)L^k & \sum_{k=0}^{\infty} a_{12}(k)L^k \\ \sum_{k=0}^{\infty} a_{21}(k)L^k & \sum_{k=0}^{\infty} a_{22}(k)L^k \end{bmatrix} \quad (4.2)$$

where L is the lag operator and k is the number of lags. It must be noted that (4.1) is the model of interest but it cannot be estimated straightaway since ε_t is unobserved. To arrive at this equation, we need to estimate a vector autoregressive (VAR) model using the components of X_t as specified below¹⁰⁸:

$$\begin{aligned} \Delta y_t &= \sum_{k=1}^p (\varphi_{11,k} \Delta y_{t-k} + \varphi_{12,k} \Delta p_{t-k}) + e_t^y \\ \Delta p_t &= \sum_{k=1}^p (\varphi_{21,k} \Delta y_{t-k} + \varphi_{22,k} \Delta p_{t-k}) + e_t^p \end{aligned} \quad (4.3)$$

where e_t^y and e_t^p are the serially uncorrelated residual terms from which the demand and supply shocks are deduced. The residual terms in the VAR are the j -step ahead forecast errors, $e_t(j)$, of y_t and p_t (with $j = 1, 2, \dots, j$). For example, the one-step ahead forecast error of y_t is given by $e_t^y(1) = \Delta y_t - E_{t-1} \Delta y_t$ (where $E_{t-1} \Delta y_t$ is the previous year's expectation of Δy_t); and from (4.1), the one-step ahead forecast error of y_t is represented by $a_{11}(0)\varepsilon_{dt} + a_{12}(0)\varepsilon_{st}$, at lag zero (i.e. $k=0$), where ε_{dt} and ε_{st} are as explained above. With equivalence having been established, we can

¹⁰⁸ Refer to Enders (2004, pp. 301-306) for further explanation of this model.

obtain a relationship between the residual terms and the unobserved demand and supply shocks as follows:

$$e_t^y = a_{11}(0)\varepsilon_{dt} + a_{12}(0)\varepsilon_{st} \quad (4.4)$$

$$e_t^p = a_{21}(0)\varepsilon_{dt} + a_{22}(0)\varepsilon_{st} \quad (4.5).$$

The two immediate equations above can then be written in a matrix form as

$$\begin{bmatrix} e_t^y \\ e_t^p \end{bmatrix} = \begin{bmatrix} a_{11}(0) & a_{12}(0) \\ a_{21}(0) & a_{22}(0) \end{bmatrix} \begin{bmatrix} \varepsilon_{st} \\ \varepsilon_{dt} \end{bmatrix} \quad (4.6).$$

This relationship makes it possible for us to recover the desired demand and supply shocks by imposing four restrictions, with the first three emanating from the variance-covariance matrix of the VAR residuals as follows:

$$\text{Var}(e_t^y) = a_{11}(0)^2 + a_{12}(0)^2 \quad (4.7)$$

$$\text{Var}(e_t^p) = a_{21}(0)^2 + a_{22}(0)^2 \quad (4.8)$$

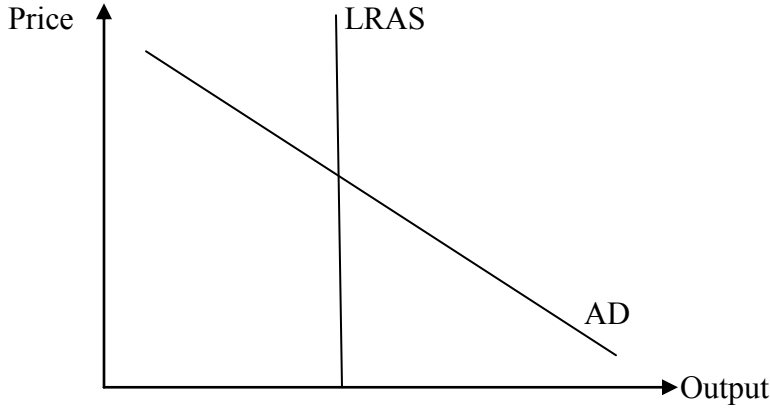
$$E(e_t^y e_t^p) = a_{11}(0)a_{21}(0) + a_{12}(0)a_{22}(0) \quad (4.9).$$

The fourth restriction is based on the assumption that demand shocks (ε_{dt}) have no long-run impact on output (y_t), which is represented by

$$\sum_{k=0}^{\infty} a_{12}(k)\varepsilon_{dt-k} = 0 \quad (4.10).$$

This is borne out of the classical theory of a vertical long-run aggregate supply (LRAS) curve and a downward sloping aggregate demand (AD) curve as shown in Figure 4.1. The theory holds that only shifts in the LRAS can affect both output and prices, whereas shifts in the AD curve can only affect prices in the long-run owing to the full employment of resources. It points to two main determinants of business cycles in the long-run, which are technological change and oil price shocks. Given the four equations, (4.7) to (4.10), and the four unknowns (a_{11} , a_{12} , a_{21} , and a_{22}), the demand and supply shocks can easily be obtained from (4.6).

Figure 4.1 Long-run Aggregate Demand and Supply Curves



One limitation of the above model is its failure to decipher the sources of business cycles. The 3-variable model below, developed by CK¹⁰⁹, helps to bring the sources of business cycles into perspective by breaking down shocks into global, regional and country-specific shocks. From (4.1), this system can be written as

$$\begin{bmatrix} \Delta y_t^G \\ \Delta y_t^R \\ \Delta y_t^C \end{bmatrix} = \begin{bmatrix} A_{11} & A_{12} & A_{13} \\ A_{21} & A_{22} & A_{23} \\ A_{31} & A_{32} & A_{33} \end{bmatrix} \begin{bmatrix} \varepsilon_t^G \\ \varepsilon_t^R \\ \varepsilon_t^C \end{bmatrix} \quad (4.11)$$

where Δy_t^G , Δy_t^R and Δy_t^C are the natural log-differences of global, regional and country (or domestic) GDPs and ε_t^G , ε_t^R and ε_t^C are global, regional and country-specific shocks respectively. In view of the small sizes of the countries under study, we assume that ε_t^R and ε_t^C have no long-run effects on Δy_t^G ; and ε_t^C has no long-run effect on Δy_t^R but ε_t^G has a long-run impact on both Δy_t^R and Δy_t^C just as ε_t^R has a long-run effect on Δy_t^C . These assumptions facilitate the identification of the model.

To arrive at the VMA model above, a VAR model, as outlined below, is estimated in order to generate the residual terms (i.e. e_t^G , e_t^R and e_t^C) from which the real shocks are deduced.

¹⁰⁹ CK contend that the shocks are a combination of both demand and supply shocks. We argue that this would nullify the fundamental BQ methodology, which clearly delineates between the two. In applying this model, we argue that the shocks are, at best, output shocks, since they are largely made up of output.

$$\Delta y_t^G = \sum_{k=1}^p (\varphi_{11,k} \Delta y_{t-k}^G + \varphi_{12,k} \Delta y_{t-k}^R + \varphi_{13,k} \Delta y_{t-k}^C) + e_t^G \quad (4.12)$$

$$\Delta y_t^R = \sum_{k=1}^p (\varphi_{21,k} \Delta y_{t-k}^G + \varphi_{22,k} \Delta y_{t-k}^R + \varphi_{23,k} \Delta y_{t-k}^C) + e_t^R \quad (4.13)$$

$$\Delta y_t^C = \sum_{k=1}^p (\varphi_{31,k} \Delta y_{t-k}^G + \varphi_{32,k} \Delta y_{t-k}^R + \varphi_{33,k} \Delta y_{t-k}^C) + e_t^C \quad (4.14).$$

Where the φ 's represent the impact coefficients and the dependent and independent variables are as previously defined.

Having generated the residual terms, some restrictions are imposed on them to help identify the model. Furthermore, a relationship between the real shocks, i.e. the last vector on the right hand side (RHS) in (4.11), and the residual terms needs to be established in order to be able to extract the real shocks. Just like (4.4) and (4.5), a relationship can be established between the residual terms and the real shocks using the one-step ahead forecasts of the dependent variables as follows:

$$e_t^G = a_{11}(0)\varepsilon_t^G + a_{12}(0)\varepsilon_t^R + a_{13}(0)\varepsilon_t^C \quad (4.15)$$

$$e_t^R = a_{21}(0)\varepsilon_t^G + a_{22}(0)\varepsilon_t^R + a_{23}(0)\varepsilon_t^C \quad (4.16).$$

The equations above (and a third one) can then be cast in a matrix form to establish a relationship between the residual terms and the real shocks as depicted in (4.17) below

$$\begin{bmatrix} e_t^G \\ e_t^R \\ e_t^C \end{bmatrix} = \begin{bmatrix} a_{11}(0) & a_{12}(0) & a_{13}(0) \\ a_{21}(0) & a_{22}(0) & a_{23}(0) \\ a_{31}(0) & a_{32}(0) & a_{33}(0) \end{bmatrix} \begin{bmatrix} \varepsilon_t^G \\ \varepsilon_t^R \\ \varepsilon_t^C \end{bmatrix} \quad (4.17).$$

Following from here, six restrictions are imposed on the residual terms based on the variance-covariance matrix. These are specified below, bearing in mind that the shocks are uncorrelated.

$$\text{Var}(e_t^G) = a_{11}(0)^2 + a_{12}(0)^2 + a_{13}(0)^2 \quad (4.18)$$

$$\text{Var}(e_t^R) = a_{21}(0)^2 + a_{22}(0)^2 + a_{23}(0)^2 \quad (4.19)$$

$$\text{Var}(e_t^C) = a_{31}(0)^2 + a_{32}(0)^2 + a_{33}(0)^2 \quad (4.20)$$

$$E(e_t^G e_t^R) = a_{11}(0)a_{21}(0) + a_{12}(0)a_{22}(0) + a_{13}(0)a_{23}(0) \quad (4.21)$$

$$E(e_t^G e_t^C) = a_{11}(0)a_{31}(0) + a_{12}(0)a_{32}(0) + a_{13}(0)a_{33}(0) \quad (4.22)$$

$$E(e_t^R e_t^C) = a_{21}(0)a_{31}(0) + a_{22}(0)a_{32}(0) + a_{23}(0)a_{33}(0) \quad (4.23).$$

Given that both the regional and country-specific shocks have no long-run impact on global output and country-specific shocks have no long-run impact on regional output, three more restrictions are imposed such that the cumulative impact of these shocks becomes zero. The three, which help to complete the identification of the model, are as follows:

$$\sum_{k=0}^{\infty} a_{12}(k) \varepsilon_{t-k}^R = 0 \quad (4.24)$$

$$\sum_{k=0}^{\infty} a_{13}(k) \varepsilon_{t-k}^C = 0 \quad (4.25)$$

$$\sum_{k=0}^{\infty} a_{23}(k) \varepsilon_{t-k}^C = 0 \quad (4.26).$$

After generating the global, regional and country-specific shocks, a variance decomposition test is conducted to ascertain the shares of each of these shocks in the individual countries' business cycles.

4.1.2 Endogeneity Analysis Methodology

The endogeneity theory has gained prominence in recent times. The theory maintains that many of the OCA criteria as well as the convergence criteria of monetary unions can be achieved *ex post*, so a country's inability to achieve them *ex ante* should not preclude it from monetary union membership. De Grauwe and Mongelli (2005), for instance, establish that the adopted policies over the period leading up to the establishment of the EMU led to the achievement of a significant convergence of euro prices, owing to the fact that all the countries played by the same monetary rules. Moreover, studies by Rose (2000) and Engel and Rose (2002) have established a strong relationship between monetary unions and intra-regional trade deepening. Using the

gravity model, augmented with a dummy variable indicating whether countries share the same currency or not, in addition to other dummy variables, Rose (2000) reports that bilateral trade between countries that use the same currency is, controlling for other effects, over 200 percent larger than otherwise. Many other studies have confirmed a high positive and significant dummy coefficient.

It must be underscored that the endogeneity paradigm does not stop with prices and trade alone. There are labour, financial, and political endogeneities, among others. However, this study concentrates on price, trade and demand and supply shocks endogeneities to ascertain whether these endogeneities are a possibility in the WAMZ.

Price Endogeneity

The study analyzes price trends of the WAEMU by paying attention to the prices of countries which have not been with the Zone throughout the entire period under study. A similar analysis is made for the WAMZ by comparing pre-and-post 2001 price trends to ascertain whether prices converged with the advent of the WAMI in 2001 or otherwise.

Endogeneity of Demand and Supply Shocks

As a test for endogeneity, the study employs the correlation of demand shocks in the WAEMU to ascertain if they have become similar. This is an endogeneity test because the Zone has been in a monetary union for over sixty years. A similar analysis is done using supply shocks. This is done by employing (4.1) using WAEMU data. The study sought to draw similar conclusions for the WAMZ based on the results of the above shocks correlations. This is because the WAMZ shares many characteristics with the WAEMU, as a result of which the

synchronization or otherwise of demand and supply shocks in the WAEMU could be seen as a shadow of what to expect in the WAMZ.

Trade Endogeneity

The study applies the gravity model of international trade to ascertain the effect monetary union membership has on trade. More specifically, the study sets out to establish whether membership in the WAEMU (herein called the CFA zone) has caused countries to experience increased reciprocal trade in comparison with the WAMZ, and if so, by how much? The model in question is as follows:

$$\ln(Trade)_{ijt} = \beta_0 + \beta_1 \ln(Y_i Y_j)_t + \beta_2 \ln D_{ij} + \beta_3 \ln(Area_{ij}) + \beta_4 Z_{ijt} + \vartheta CFA_{ijt} + \varepsilon_{ijt} \quad (4.27)$$

where i and j represent two countries, t denotes time and the β s are the impact coefficients. The variable $Trade_{ijt}$ represents the average value of real bilateral trade between countries i and j at time t ; Y is real GDP, D_{ij} is the distance between i and j ; $Area$ is the product of the land mass of the two countries; CFA is a binary variable which is one if the two countries are members of the WAEMU and zero if one or both of them is/are not a member(s) of the Zone. Its coefficient, ϑ , is the effect of monetary union on trade. The variable Z is a vector of other binary variables – membership of the West African Monetary Institute's programmes (*WAMI*), *Border* (which is one if the two countries share a common geographical border and zero otherwise), *Colonizer* (which is one if the two countries were colonized by the same country and zero otherwise), and *CFA94* (which is one if the two countries were directly affected by the 1994 devaluation of the CFA franc and zero otherwise). Finally, ε_{ijt} is the idiosyncratic error term.

4.1.3 Exchange Rate Union Analysis Methodology

As an alternative to a full monetary union in the short-to-medium term, two exchange rate arrangements are analyzed. In the first scenario, we test for possible co-movements among exchange rates in the WAMZ to ascertain whether a single exchange rate policy will favour all of them. This is done by extending (4.1) to include the real exchange rates of the individual countries and subsequently extracting and subjecting the exchange rate shocks to correlation tests.

The model is of this form

$$\begin{bmatrix} \Delta y_t \\ \Delta r_t \\ \Delta P_t \end{bmatrix} = \begin{bmatrix} A_{11} & A_{12} & A_{13} \\ A_{21} & A_{22} & A_{23} \\ A_{31} & A_{32} & A_{33} \end{bmatrix} \begin{bmatrix} \varepsilon_{st} \\ \varepsilon_{rt} \\ \varepsilon_{dt} \end{bmatrix} \quad (4.28)$$

where Δy_t , Δr_t and Δp_t represent the natural log-differences of output, real exchange rate and prices, respectively; and ε_{st} , ε_{rt} and ε_{dt} represent supply, real exchange rate and demand shocks, respectively¹¹⁰. The other variables are as explained under (4.1). To help identify the system, we assume that exchange rate and demand shocks do not affect output in the long-run and demand shocks do not affect real exchange rates in the long-run. However, both supply and exchange rate shocks affect the real exchange rate in the long-run and supply shocks affect output in the long-run. Finally, all the three shocks affect price changes in the long-run. Since only supply side factors affect output in the long-run, both demand and real exchange rate shocks have no long-run impact on Δy , but supply shocks have an impact on both prices and the real exchange. Likewise, since the level of the real exchange rate is virtually out of the hands of the monetary authority in a purely floating regime, demand shocks do not affect the level of the real exchange

¹¹⁰ This is a departure from Zhang *et al* (2004) who hold this shock as the demand shock and the last one as the monetary shock. An exchange rate shock is not necessarily a monetary shock. We match exchange rate shocks with the real exchange rate and demand shocks to prices. This is because the central bank determines monetary policy which directly affects demand shocks. The impact is finally reflected in prices. However, in pure floating regimes, control over the real exchange rate is out of the hands of the central bank. It is determined by the nominal exchange rate (which is established by the forces of demand and supply of hard currencies), foreign and domestic CPIs.

rate, but real exchange rate shocks affect prices. As Barro (2004) puts it, price co-movements are established by real exchange rates and not the other way round.

Following from (4.11), the VAR model is estimated as follows:

$$\Delta y_t = \sum_{k=1}^p (\varphi_{11,k} \Delta y_{t-k} + \varphi_{12,k} \Delta r_{t-k} + \varphi_{13,k} \Delta p_{t-k}) + e_t^y \quad (4.29)$$

$$\Delta r_t = \sum_{k=1}^p (\varphi_{21,k} \Delta y_{t-k} + \varphi_{22,k} \Delta r_{t-k} + \varphi_{23,k} \Delta p_{t-k}) + e_t^r \quad (4.30)$$

$$\Delta p_t = \sum_{k=1}^p (\varphi_{31,k} \Delta y_{t-k} + \varphi_{32,k} \Delta r_{t-k} + \varphi_{33,k} \Delta p_{t-k}) + e_t^p \quad (4.31)$$

where e_t^y , e_t^r and e_t^p represent the error terms of the respective equations; and the φ 's, the dependent and independent variables, are as previously defined.

The following six restrictions are imposed on the residual terms based on the variance-covariance matrix.

$$\text{Var}(e^y) = a_{11}(0)^2 + a_{12}(0)^2 + a_{13}(0)^2 \quad (4.32)$$

$$\text{Var}(e^r) = a_{21}(0)^2 + a_{22}(0)^2 + a_{23}(0)^2 \quad (4.33)$$

$$\text{Var}(e^p) = a_{31}(0)^2 + a_{32}(0)^2 + a_{33}(0)^2 \quad (4.34)$$

$$E(e^y e^r) = a_{11}(0)a_{21}(0) + a_{12}(0)a_{22}(0) + a_{13}(0)a_{23}(0) \quad (4.35)$$

$$E(e^y e^p) = a_{11}(0)a_{31}(0) + a_{12}(0)a_{32}(0) + a_{13}(0)a_{33}(0) \quad (4.36)$$

$$E(e^r e^p) = a_{21}(0)a_{31}(0) + a_{22}(0)a_{32}(0) + a_{23}(0)a_{33}(0) \quad (4.37).$$

Given that both the real exchange rates and demand shocks have no long-run impact on output and demand shocks have no long-run impact on the real exchange rate, three more restrictions are imposed such that the cumulative impact of these shocks becomes zero. This helps to complete the identification of the model. These are:

$$\sum_{k=0}^{\infty} a_{12}(k) \varepsilon_{rt-k} = 0 \quad (4.38)$$

$$\sum_{k=0}^{\infty} a_{13}(k) \varepsilon_{dt-k} = 0 \quad (4.39)$$

$$\sum_{k=0}^{\infty} a_{23}(k) \varepsilon_{dt-k} = 0 \quad (4.40).$$

After generating the supply, real exchange rate and demand shocks, the respective country shocks are correlated to check if they experience shocks co-movements. This is indicated by positive and significant correlation coefficients. Of particular interest at this point is the correlation of the real exchange rate shocks. If the correlation coefficients are all positive and significant, then a WAMZ exchange rate arrangement based on domestic currencies, like the EMS, might be an optimal option.

In the second case, we seek to find a probable anchor currency to which to peg all the regional currencies. Naturally, the currency of the largest economy in the region should be selected as an anchor in any exchange rate arrangement. But since Nigeria has not been a leader when it comes to stability, we experiment with those of the United States and twelve Euro Area countries¹¹¹. We use the log-difference of Germany's GDP deflator to represent the twelve Euro Area countries' prices. The model of interest is also a derivative of (4.1) and is stated as follows:

$$\begin{bmatrix} \Delta y_t^f \\ \Delta p_t^f \\ \Delta y_t^d \\ \Delta p_t^d \end{bmatrix} = \begin{bmatrix} A_{11} & A_{12} & A_{13} & A_{14} \\ A_{21} & A_{22} & A_{23} & A_{24} \\ A_{31} & A_{32} & A_{33} & A_{34} \\ A_{41} & A_{42} & A_{43} & A_{44} \end{bmatrix} \begin{bmatrix} \varepsilon_{st}^f \\ \varepsilon_{dt}^f \\ \varepsilon_{st}^d \\ \varepsilon_{dt}^d \end{bmatrix} \quad (4.41)$$

where the first and second elements in the first matrix on the left hand side (LHS) represent the natural log-differences of foreign (that is the US or the twelve Euro Area countries) output and price respectively; and the last two represent the natural log-differences of domestic output and price respectively. The last matrix (from top to bottom) holds foreign supply, foreign demand, domestic supply and domestic demand shocks, respectively. Like (4.1) and following the small country assumption, the upper triangular elements of the A matrix become zero in the long-run. This means that, in the long-run, only foreign supply shocks affect foreign output; only foreign

¹¹¹ Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain.

supply and demand shocks affect foreign prices; only foreign supply, demand and domestic supply shocks affect domestic output; and all the shocks affect domestic prices.

The VAR model to be estimated is of the form

$$\Delta y_t^f = \sum_{k=1}^p (\varphi_{11,k} \Delta y_{t-k}^f + \varphi_{12,k} \Delta p_{t-k}^f + \varphi_{13,k} \Delta y_{t-k}^d + \varphi_{14,k} \Delta p_{t-k}^d) + e_t^{yf} \quad (4.42)$$

$$\Delta p_t^f = \sum_{k=1}^p (\varphi_{21,k} \Delta y_{t-k}^f + \varphi_{22,k} \Delta p_{t-k}^f + \varphi_{23,k} \Delta y_{t-k}^d + \varphi_{24,k} \Delta p_{t-k}^d) + e_t^{pf} \quad (4.43)$$

$$\Delta y_t^d = \sum_{k=1}^p (\varphi_{31,k} \Delta y_{t-k}^f + \varphi_{32,k} \Delta p_{t-k}^f + \varphi_{33,k} \Delta y_{t-k}^d + \varphi_{34,k} \Delta p_{t-k}^d) + e_t^{yd} \quad (4.44)$$

$$\Delta p_t^d = \sum_{k=1}^p (\varphi_{41,k} \Delta y_{t-k}^f + \varphi_{42,k} \Delta p_{t-k}^f + \varphi_{43,k} \Delta y_{t-k}^d + \varphi_{44,k} \Delta p_{t-k}^d) + e_t^{pd} \quad (4.45)$$

where e^{yf} , e^{pf} , e^{yd} and e^{pd} represent the residual terms of the foreign output, foreign prices, domestic output and domestic prices equations, respectively. Following from the first case, sixteen restrictions were employed with the restrictions emanating from the variance-covariance matrix as follows:

$$\text{Var}(e^{yf}) = a_{11}(0)^2 + a_{12}(0)^2 + a_{13}(0)^2 + a_{14}(0)^2 \quad (4.46)$$

$$\text{Var}(e^{pf}) = a_{21}(0)^2 + a_{22}(0)^2 + a_{23}(0)^2 + a_{24}(0)^2 \quad (4.47)$$

$$\text{Var}(e^{yd}) = a_{31}(0)^2 + a_{32}(0)^2 + a_{33}(0)^2 + a_{34}(0)^2 \quad (4.48)$$

$$\text{Var}(e^{pd}) = a_{41}(0)^2 + a_{42}(0)^2 + a_{43}(0)^2 + a_{44}(0)^2 \quad (4.49).$$

The co-variances are as follows:

$$E(e^{yf} e^{pf}) = a_{11}(0)a_{21}(0) + a_{12}(0)a_{22}(0) + a_{13}(0)a_{23}(0) + a_{14}(0)a_{24}(0) \quad (4.50)$$

$$E(e^{yf} e^{yd}) = a_{11}(0)a_{31}(0) + a_{12}(0)a_{32}(0) + a_{13}(0)a_{33}(0) + a_{14}(0)a_{34}(0) \quad (4.51)$$

$$E(e^{yf} e^{pd}) = a_{11}(0)a_{41}(0) + a_{12}(0)a_{42}(0) + a_{13}(0)a_{43}(0) + a_{14}(0)a_{44}(0) \quad (4.52)$$

$$E(e^{pf} e^{yd}) = a_{21}(0)a_{31}(0) + a_{22}(0)a_{32}(0) + a_{23}(0)a_{33}(0) + a_{24}(0)a_{34}(0) \quad (4.53)$$

$$E(e^{pf} e^{pd}) = a_{21}(0)a_{41}(0) + a_{22}(0)a_{42}(0) + a_{23}(0)a_{43}(0) + a_{24}(0)a_{44}(0) \quad (4.54)$$

$$E(e^{yd} e^{pd}) = a_{31}(0)a_{41}(0) + a_{32}(0)a_{42}(0) + a_{33}(0)a_{43}(0) + a_{34}(0)a_{44}(0) \quad (4.55).$$

The long-run restrictions then become:

$$\sum_{k=0}^{\infty} a_{12}(k) \varepsilon_{dt-k}^f = 0 \quad (4.56)$$

$$\sum_{k=0}^{\infty} a_{13}(k) \varepsilon_{st-k}^d = 0 \quad (4.57)$$

$$\sum_{k=0}^{\infty} a_{14}(k) \varepsilon_{dt-k}^d = 0 \quad (4.58)$$

$$\sum_{k=0}^{\infty} a_{23}(k) \varepsilon_{st-k}^d = 0 \quad (4.59)$$

$$\sum_{k=0}^{\infty} a_{24}(k) \varepsilon_{dt-k}^d = 0 \quad (4.60)$$

$$\sum_{k=0}^{\infty} a_{34}(k) \varepsilon_{dt-k}^d = 0 \quad (4.61).$$

The model is used to test whether the WAMZ would be better off using the dollar or the euro as an anchor.

4.2 Data

The data set for this study was drawn mainly from the IMF's *Direction of Trade Statistics* (*DOT*, CD-ROM 2009) and the World Bank's *World Development Indicators* (*WDI*, CD-ROM 2008). Apart from the gravity model, which was estimated with data spanning 1980 and 2006, all the other models are estimated with data from 1960 to 2006. Bilateral trade (using *fob* exports and *cif* imports) from the *DOT* was averaged and deflated by the United States' Consumer Price Index (CPI) to generate real bilateral trade. Furthermore, GDP (at constant 2000 US\$) was drawn from the *WDI*, while land sizes and the distance between countries' commercial centres were drawn from the *CIA World Factbook* and geobytes.com, respectively. Finally, the *CFA* and *CFA94* dummy variables were put together mindful of the re-entry of Mali into the CFA zone in 1987, after having exited the group at independence, and the entrance of Guinea-Bissau in 1997.

Since the *DOT* data for the West African countries does not include pre-1980 series, the study could not assess the impact of the West African Currency Board (which comprised The

Gambia, Ghana, Nigeria, Sierra Leone, among others) on intra-regional trade. It would have been interesting to be able to ascertain the impact of this currency board, which was dissolved in 1965, on West African trade. However, owing to transportation difficulties and the lack of effective coordination mechanisms in place at the time, the study reckons that it could be that the currency board could not have had a significant impact after all.

4.3 Treatment of Variables and their Expected Signs

4.3.1 Shocks Analysis

Owing to the low levels of intra-regional trade, dissimilarities in export structures and the lack of effective sub-regional economic institutions to facilitate the convergence of economic activities, it was expected that the correlation of both demand and supply shocks would yield negative results in the WAMZ. Furthermore, because of their unique export structures, domestic factors were more likely to be the major causes of business cycles than any other factor. In addition, since the countries have failed to capitalize on globalization to deepen intra-regional trade but have chosen to solidify external trade, global shocks were expected to be more important than regional shocks in explaining business cycles.

On the endogeneity of demand and supply shocks in the WAEMU (an *ex post* analysis), it was expected that demand shocks would be highly correlated but supply shocks correlations would be rather mixed.

4.3.2 Trade Endogeneity Analysis

This section throws a bit more light on the sources of the data for the gravity model, the treatment of the data and their expected signs.

Trade: The data on trade was culled from the IMF's *Direction of Trade (DOT)* statistics. Bilateral trade was calculated as the average of bilateral exports (*fob*) and imports (*cif*), mindful of the fact that there were cases where one country would fail to report bilateral trade. When both countries reported bilateral trade, all four would be summed up and divided by four. If three were reported, they would be divided by three; and divided by two if only one country reported. Furthermore, because the data is recorded in United States dollars, the trade data was deflated by the United States' CPI, which was sourced from the IMF's *International Financial Statistics (IFS)*.

Real GDP: This was sourced from the World Bank's *World Development Indicators (WDI)*. The product of the real GDPs of countries were taken in order to fit the model specification. It was expected to have a positive coefficient since income growth engenders more trade.

Distance (D): The distances between countries were calculated with the help of geobytes.com. Preference was given to the distances between commercial centres rather than capital cities since they tend to be trade hubs. However, in many cases, the capital cities serve as commercial centres. It is expected to have a negative coefficient since the longer the distance between two centres, the less likely it is that trade will transpire between them. That is to say, the cost of trade increases with distance since transportation costs increase.

Area: This data was sourced from the *CIA World Factbook*. The data is also available in the *WDI* but they have been rounded off. The CIA's data are comparatively more precise. The coefficient is expected to be negative just like that of *D*. Countries with large land areas find it more difficult to trade with other countries, due to the fact that it might be less costly to trade within than without.

CFA: This is a dummy variable which is one if the two countries are members of the CFA zone and zero otherwise. Its coefficient, which is a test of the trade endogeneity theory, was expected to be positive. From theory, the usage of a common currency reduces transaction costs to trade, thus, triggering trade.

Border: This is a dummy variable which is one if the two countries share a geographic border and zero otherwise. The coefficient was expected to be positive since the cost of trade is expected to reduce if countries are border neighbours than otherwise.

Colonizer: For West Africa, this dummy variable is interchangeable with the language dummy. This is because each former colony adopted the language of its former colonial powers as the official language. The variable is one if the two countries were colonized by the same country and zero otherwise. It was expected to have a positive coefficient since having the same colonizer creates a special bond among countries through the medium of language, which in turn makes communication easier.

CFA94: It is a dummy variable which is one if the two countries were members of the CFA zone when the CFA franc was devalued in 1994 and zero, if otherwise. It was expected to have a negative sign since the devaluation was carried out with external rather than internal trade deepening in mind.

WAMI: This is a dummy variable which is one if the two countries started working towards the same monetary objectives, as supervised by the WAMI from 2001, and zero, if otherwise. It was expected to have a negative coefficient since very little emphasis was placed on intra-regional trade by the WAMI. The WAMI was meant to prepare the grounds for a future regional central bank, but not to tackle trade-related issues.

4.3.3 Exchange Rate Union Analysis

The real exchange rate was calculated by subtracting the natural log of domestic GDP deflator from that of the US and adding the result to the natural log of the nominal exchange rate which was sourced from the *WDI*.

Owing to the low trade relations among themselves and the independent monetary policies they have pursued in times past, it was expected that the exchange rate correlations of the WAMZ would be no different from their demand and supply shocks as stated above. However, the decision as to whether to use the dollar or the euro as anchor currency was vague at this point since the countries have practiced an open trade policy with the two of them.

4.4 Concluding Remarks

This chapter has sought to discuss the methodology for the study. It discussed both the *ex ante* and *ex post* approaches to the study by focusing on the BQ model in analyzing shocks co-movements in the *ex ante* case; and the gravity model as well as graphs in analyzing the *ex post* version of the OCA theory. Furthermore, explanations of how the BQ methodology is used to analyze how the WAEMU has fared in the achievement of demand and supply shocks after more than sixty years of monetary unification was given. This test of endogeneity is used as a litmus test for the ability of the WAMZ to achieve shocks synchronicity *ex post*.

Chapter Five

Model Estimation, Results and Analyses

5. Introduction

This chapter focuses on the procedures leading up to the estimation of the empirical models as discussed in the previous chapter. It describes the variables and data used in the regressions and interprets the results of the estimated models. The first few paragraphs discuss the time series characteristics of the data by testing for unit roots as a way of avoiding spurious regressions.

For the *ex ante* analyses, two Structural Vector Autoregressive (SVAR) models are estimated – one that involves the decomposition of shocks into supply and demand shocks and one that decomposes shocks into country-specific, regional and global shocks. The analyses in relation to the above are based on four-prong reference points:

- a) the correlation of countries' supply as well as demand shocks (with particular emphasis on the correlation of supply shocks)
- b) the use of the variance decomposition results to assess the effects of shocks on output and prices, as well as the effects of country-specific, regional and global shocks on each country's business cycles
- c) the size of country shocks; and
- d) the adjustment speed for each economy.

For the shocks correlation, the whole sample period is first discussed, after which sub-period analyses, involving pre-and-post Structural Adjustment Programmes (SAPs) as well as decade-by-decade analyses, are done to ascertain whether there were any particular periods of increased co-movement of shocks.

The chapter also assesses the possibility of the *ex post* achievement of the OCA criteria in the WAMZ using the WAEMU as a reference point. It analyzes price and bilateral trade variables to ascertain whether price and trade endogeneities are a possibility as long as countries adhere to common but strict monetary rules and enhanced policy coordination. It also analyzes the demand and supply shocks correlations of the WAEMU, the results of which are used to make policy recommendations to the WAMZ. Using the gravity model, this chapter seeks to establish whether the WAEMU has gained an intra-regional trade increment advantage over the WAMZ because of its use of a single currency as opposed to the multiple currencies circulating within the WAMZ.

5.1 Analysis of Data and Stationarity Tests

The first model (4.1), the supply and demand shocks model, required two variables for each of the five WAMZ countries. The variables are GDP growth and inflation. For GDP growth, the study employed the natural log-difference of GDP in the local currency unit (LCU) and the natural log-difference of the GDP deflator to represent inflation. Data on these variables, spanning 1960 to 2006, was sourced from the *World Development Indicators* CD-ROM (2008) and the *International Financial Statistics* CD-ROM (2009). Data on Ghana, Nigeria and Sierra Leone was available from 1960, however, The Gambia missed a few observations between 1960 and 1966 for both variables, with both of Guinea's series starting from 1979.

For the second model (4.11), the combined GDP of twelve Euro Area countries was used as proxy for Europe, and the GDPs of the twelve Euro Area countries and the United States of America were used to represent global GDP. This is because the WAMZ countries trade more extensively with these two partners than with any other global group. As a departure from the

study by CK, this study uses the growth of real GDP rather than the growth of industrial production, as a result of the fact that only Nigeria's industrial output is recorded in the *IFS*.

Table 5.1 and Appendix 7 describe the trends for the variables.

Table 5.1 Unit Root Tests using the Augmented Dickey-Fuller Test

	Intercept		Intercept and Trend	
Country	Levels	1st Difference	Levels	1st Difference
Growth of GDP Series				
The Gambia	-7.11674 ^a		-7.17688 ^a	
Ghana	-4.8060 ^a		-5.11336 ^a	
Guinea	-3.38797 ^b		-3.35813 ^a	
Nigeria	-4.29747 ^a		-4.23200 ^a	
Sierra Leone	-4.97583 ^a		-4.91491 ^a	
WAMZ	-6.24115 ^a		-6.14892 ^a	
Global	-5.72808 ^a		-6.38067 ^a	
Change in GDP Deflator (inflation) Series				
The Gambia	-3.75326 ^a		-3.70497 ^a	
Ghana	-3.7421 ^a		-3.69353 ^a	
Guinea	-2.39529 ^c	-6.71456 ^a	-2.28870 ^c	-6.34989 ^a
Nigeria	-4.971652 ^a		-5.24202 ^a	
Sierra Leone	-2.29191 ^c	-6.98961 ^a	-2.24114 ^c	-6.9456 ^a

Source: Author's Calculations

^asignificant at the 1 percent level

^bsignificant at the 5 percent level

^cnot significant

All the real GDP growth series (intercept only and intercept and trend) were significant at the 1 and 5 percent levels. The inflation series of Guinea and Sierra Leone were significant after the first difference, but those of the other countries were significant at levels. Since the model requires all variables to be stationary, Guinea and Sierra Leone's inflation variables were differenced.

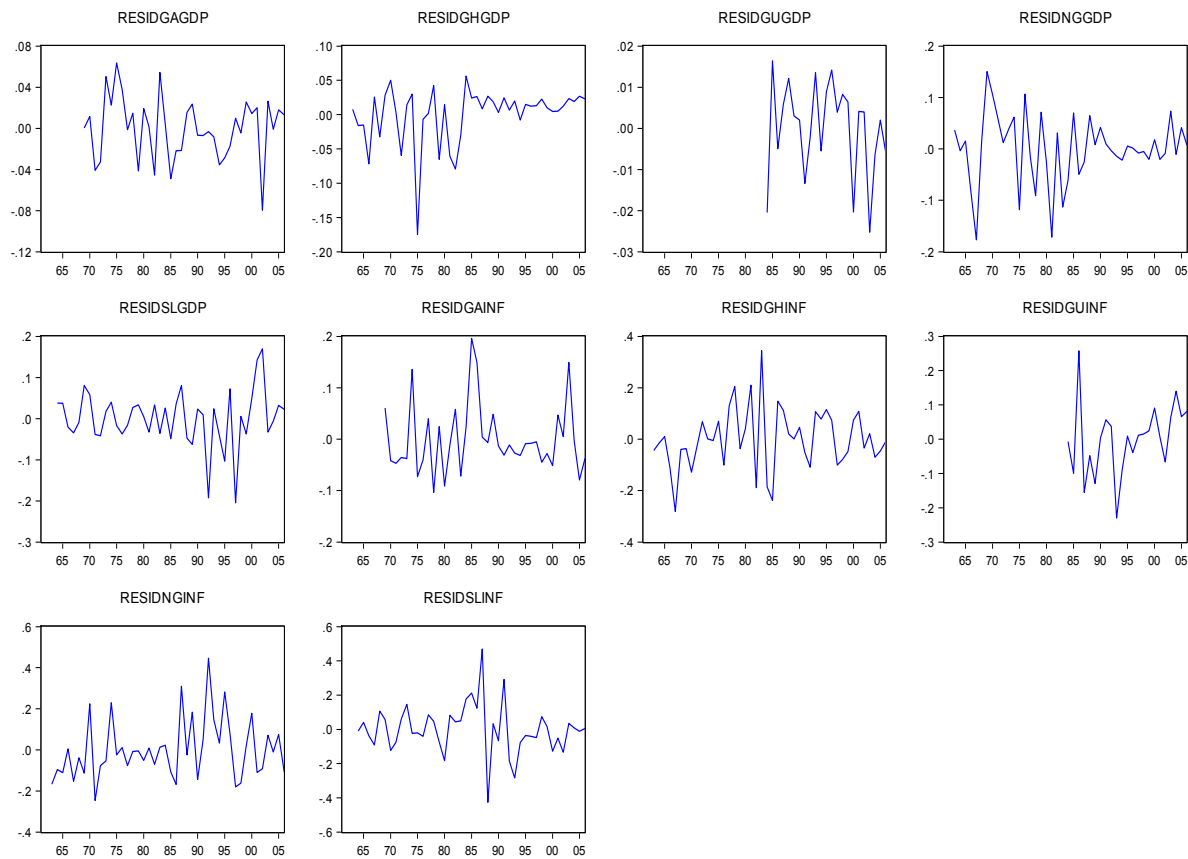
5.2 Estimation Procedure and Empirical Results

5.2.1 Supply and Demand Shocks Model

Having de-trended the nonstationary series, the vector autoregressive (VAR) model (4.3) was estimated in order to generate the residual terms as a first step to recovering the aggregate demand and supply shocks. The model was estimated inclusive of a constant term because the sum of the residuals of the model with a constant better approximated to zero than the one without a constant term. An optimal lag length of two was chosen with the help of the Akaike Information Criterion (AIC) and the Schwarz Information Criterion (SIC). To verify the white noise properties of the model, the residuals were subjected to serial correlation and heteroskedasticity tests. None of them were serially correlated, and all but The Gambia's model were homoskedastic. The Gambia's model was found to be heteroskedastic at the 10 percent level. In order to preserve symmetry of specification across all the economies, we were faced with the option of estimating all the models using a three-period lag (at which point The Gambia's model became homoskedastic), which would have led to the loss of some degrees of freedom, and including a model that exhibits marginal heteroskedasticity but saves us some degrees of freedom. The second option, estimating all the models at a lag length of two, was chosen in solidarity with BE, Ling (2001) and Tang (2006), among others.

The residuals were subjected to stationarity tests, the graphical representation of which is displayed in Figure 5.1, and all the residuals were found to be without unit roots.

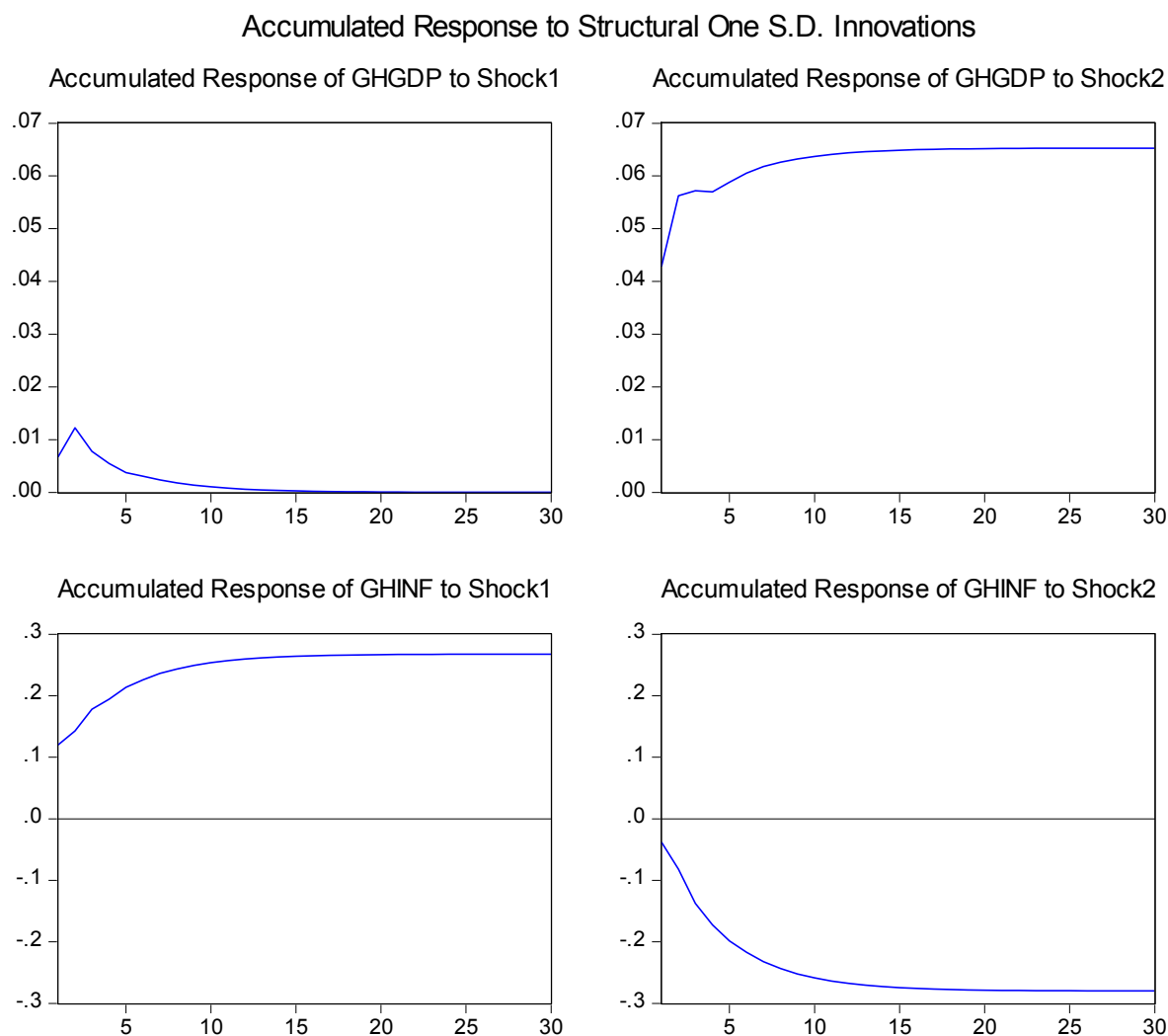
Figure 5.1 Stationarity Tests for the VAR Residuals



NOTE: RESID refers to residual. GA, GH, GU, NG and SL refer to The Gambia, Ghana, Guinea, Nigeria and Sierra Leone in that order. GDP and INF refer to real GDP growth and inflation, respectively.

Following from Tang (2006), the impulse response functions (IRFs) were used to assess the stability of the systems by ascertaining whether output and inflation responses stabilize at a long-run constant rate following a unit standard deviation of demand and supply shocks. Figure 5.2, the case of Ghana, provides evidence to that effect. It can be seen that the rest of the VAR models (as shown in Appendix 8) exhibit similar trends.

Figure 5.2 Impulse Response Functions of Output Growth and Inflation Due to Demand Shocks (Shock1) and Supply Shocks (Shock2) for Ghana



NOTE: GHGDP and GHINF represent the growth of real GDP and inflation for Ghana, respectively

Variance Decomposition Analysis of Supply and Demand Shocks

In order to ascertain the underlying causes of fluctuations in both output and prices in the WAMZ, the variance decomposition analysis was employed to decompose such fluctuations into demand and supply shocks over ten horizons as indicated in Table 5.2. The causes of the

fluctuations also point to the fundamental economic structures of the WAMZ countries, both in the short-run and the long-run.

Table 5.2 Variance Decomposition Results

Horizon	Percentage of fluctuations in real output due to:				Percentage of fluctuations in prices due to:			
	Supply Shock		Demand Shock		Supply Shock		Demand Shock	
	1	10	1	10	1	10	1	10
Gambia	99.51	95.17	0.49	4.83	4.66	14.42	95.33	85.58
Ghana	97.58	95.06	2.42	4.94	9.08	34.88	90.92	65.12
Guinea	99.21	92.49	0.79	7.51	33.92	37.06	66.08	62.94
Nigeria	99.89	99.44	0.11	0.56	0.04	2.43	99.96	97.57
Sa Leone	93.68	90.16	6.32	9.84	1.23	3.20	98.77	96.80

Source: Author's Calculations

The variance decomposition results suggest that supply factors are the major causes of business cycles within the WAMZ, but the proportions are somehow dissimilar. For example, supply shocks accounted for over 99 percent of Nigeria's output changes in the first horizon and over 99 percent of The Gambia's over the same period. However, at the end of the tenth horizon, the same shocks accounted for 99.44 percent of the fluctuations in Nigeria's GDP, as opposed to 95.17 percent for The Gambia. The effect of supply shocks on output is much more pronounced in Nigeria than in the other WAMZ countries¹¹².

Conversely, demand shocks account for a greater influence in price changes than supply shocks. Once again, the impacts are varied. While Nigeria's demand shocks accounted for 97.57 percent (99.96 percent in the first period) of the fluctuations in prices at the end of the tenth horizon, Ghana's demand shocks accounted for 65.12 percent of such fluctuations from an initial figure of 90.92 percent. Thus, supply side factors have quite an impact on prices in Ghana. But

¹¹² The significant role supply shocks play in Nigeria's GDP growth is understandable. There has always been a market for oil. It is a necessity compared to the products produced by the other countries. Nigeria's ability to grow its economy has depended on two factors – the price of oil and its ability to subdue production bottlenecks (e.g. the crisis at the Niger Delta) to fully utilize its production capacity.

the impact of supply shocks on prices is much more telling on Guinea than the rest of the WAMZ countries in the first period¹¹³. This could be traced to the extensive input controls and price controls of the 1960s, 1970s and early 1980s which culminated in capacity under-utilization and hoarding, leading to sharp price increases around the period. The same could be said for The Gambia, which has also seen import controls in the past. That is not to say that Nigeria and Sierra Leone did not suffer the same fate, owing in part to the proliferation of ISI policies in Africa shortly after independence, however, the magnitude of the impact on prices in Ghana and The Gambia is rather stupendous.

Correlation of Demand and Supply Shocks

The output and inflation correlations among the five countries, as shown in Table 3.17, established positive and significant GDP correlations between Ghana and Guinea, Ghana and Nigeria and Nigeria and Guinea. Positive and significant inflation correlations were also established between The Gambia and Guinea as well as between Guinea and Sierra Leone. As was indicated earlier, these are not the real demand and supply shocks we set out to estimate. Using the standard procedure in chapter 4, the actual demand and supply shocks were retrieved from (4.6). Tables 5.3 and 5.4 present the results of the correlations of both the demand and supply shocks respectively. A positive and significant correlation is indicative of symmetric shocks, which would mean that any two countries in question could be suitable candidates for a monetary union. But a negative and/or statistically insignificant correlation is associated with shock asymmetry which, from an economic point of view, should disqualify the two countries from joining a monetary union since a uniform monetary policy would most likely be unable to address potential shocks to the benefit of the countries.

¹¹³ This could be as a result of the relatively few observations.

Because of the non-availability of a full range data for Guinea, two sets of demand shocks correlations were made – one including Guinea and one exclusive of it. The same applies to the supply shocks correlations and the pre-SAP correlations for both demand and supply shocks in Appendix 9. Graphical representations of the full sample demand and supply correlations are presented in Appendix 10.

Demand or Transitory Shocks

The recovered demand shocks established only a single significant correlation between Nigeria and Guinea. However, this correlation is negative. This implies that the WAMZ experiences idiosyncratic demand shocks. However, as per the model assumptions and evidenced by Table 5.2, demand shocks have only transitory effects on output, so our focus will be on the supply shocks (which have a rather permanent impact on the same)¹¹⁴. The full sample demand shocks correlations (without Guinea) gave a similar account but with no significant correlations.

Table 5.3 Correlation of Demand/Transitory Shocks

With Guinea						Without Guinea			
Country	Gambia	Ghana	Guinea	Nigeria	Sa Leone	Gambia	Ghana	Nigeria	Sa Leone
Gambia	1					1			
Ghana	-0.1	1				-0.22	1		
Guinea	0.07	0.04	1						
Nigeria	-0.22	0.17	-0.37*	1		-0.06	0.10	1	
Sa Leone	0.28	-0.12	-0.05	-0.03	1	0.25	0.00	-0.05	1

Source: Author's Calculations

*Significant at the 10 percent level

Since the SAPs began in the mid-1980s to the early 1990s in the WAMZ, the study considered a pre-and-post SAP correlation analysis within the WAMZ, with the pre-SAP period ending at 1987. The shocks, inclusive of Guinea, involved only nine series, owing to data non-

¹¹⁴ BE (p.25) argue that demand disturbances include the impact of monetary and fiscal policies and are thus less likely than supply disturbances to be informative about regional patterns.

availability from 1960 to 1987. The results (in Appendix 9) showed a single correlation of about 0.95 between Nigeria and Sierra Leone at the 10 percent level of significance. The one without Guinea yielded no significant correlations. However, the post-SAP period, which began in 1988, churned out a correlation of about minus 0.40 between Guinea and Ghana at the 10 percent significance level – an indication of demand shocks asymmetry over the period.

To assess the impact of the commencement of the WAMZ, demand shocks correlations were calculated for the period 2001-2006. In chapter three, we found out that the establishment of the WAMI had helped to stabilize the macroeconomic environment in the region. However, the demand shocks correlations paint a different picture, as none of them, except the negative relationship between The Gambia and Guinea (-0.73), were significant.

The decade-by-decade correlations (also in Appendix 9) revealed that not more than two countries' demand shocks were significantly correlated within any given 10-year period. There was a positive and significant correlation between Ghana and Sierra Leone (0.62)¹¹⁵ at the 10 percent level in 1970-1979 (without Guinea) and a negative and significant correlation between Nigeria and Guinea (-0.78) at the 10 percent level in 1980-1989 but no significant correlations in 1990-1999.

Supply or Permanent Shocks

The correlation of the supply shocks (in Table 5.4) is quite interesting. While the full sample, inclusive of Guinea, establishes no correlations between any two countries, the one exclusive of Guinea states otherwise.

¹¹⁵ Inflationary trends for the two periods were similar, especially getting to the end of the 1970s. This period is marked by an economic down-turn for the two countries with adjoining inflationary pressures.

Table 5.4 Correlation of Supply/Permanent Shocks (including Guinea)

Country	Gambia	Ghana	Guinea	Nigeria	Sa Leone
The Gambia	1				
Ghana	-0.01	1			
Guinea	-0.23	-0.19	1		
Nigeria	0.01	0.04	0.10	1	
Sa Leone	-0.12	-0.16	0.02	-0.10	1

Source: Author's Calculations

The results insinuate that the WAMZ experiences asymmetric supply shocks. This is because none of the correlations were significant. This gives room for pessimism because intuitively, the adoption of a common monetary policy (which is the natural consequence of the kind of monetary unification under consideration in the WAMZ) would rather make matters worse for some of the countries within the region since such a policy would affect them disproportionately. Nigeria and Ghana, which together account for more than 92 percent of the region's GDP and 99 percent of its internal trade, experience asymmetric shocks as well since the correlation of their supply shocks was insignificant.

However, the correlation results which are exclusive of Guinea (and include 21 additional observations) give a glimmer of hope for the WAMZ. The results establish a positive and significant correlation between Ghana and Nigeria at the 1 percent significance level, as indicated in Table 5.5.

Table 5.5 Correlation of Supply/Permanent Shocks (excluding Guinea)

Country	Gambia	Ghana	Nigeria	Sierra Leone
The Gambia	1			
Ghana	-0.16	1		
Nigeria	-0.26	0.41*	1	
Sierra Leone	-0.12	0.07	0.14	1

Source: Author's Calculations

*significant at the 1 percent level

The wider data range utilized in Table 5.5 bodes well for the WAMZ compared with the shorter sample size since the two largest economies experience similar shocks. However, caution must be exercised since the other countries experience asymmetric shocks. There is the likelihood that they would be eclipsed by Nigeria and Ghana if they were to join a monetary union involving them. The pre-SAP supply shocks correlations, for example, established a negative and significant correlation (-0.92) between Nigeria and Sierra Leone at the 10 percent level.

There were no significant correlations during the post-SAP period (1988-2006) and for the sub-period, 1970-1979. There was, however, a positive and significant correlation between Ghana and The Gambia's shocks (0.56) at the 10 percent level of significance in 1990-1999, and another one (0.87) was established between Nigeria and Guinea at the 5 percent level of significance for 1980-1989. The post-WAMZ results (2001-2006) are quite interesting. The results indicate that Sierra Leone and Guinea, the only direct neighbours in the Zone, have a positive and significant supply shocks correlation between them. This could be attributed to the rising trade volumes between the two, since Sierra Leone's war had made trade practically impossible for well over a decade. Though a positive sign, the two countries are too small for this to be able to influence the WAMZ as a whole.

Overall, the supply shocks correlations, with and without Guinea, indicate that the WAMZ does not necessarily constitute an optimum currency area, since there is a general lack of co-movement of supply shocks. Indeed, as indicated above, the overall sample (without Guinea) establishes a positive and significant correlation between Ghana and Nigeria, but the pre-and-post-SAP as well as the decade-by-decade results reveal that this correlation is not a recent phenomenon. The farther into the past the sample period is, the better the correlation coefficient

and the level of significance between the two countries¹¹⁶. This is explained by the fact that Nigeria was a major cocoa producer before the oil boom of the 1970s¹¹⁷. This gives credence to the fact that similar production and/or export structures enhance the symmetry of shocks. In effect, the positive and significant correlation coefficient cannot be attributed to the recent oil-induced trade relations between the two but to the fact that Nigeria was once a major producer of cocoa, something Ghana continues to do. Since the conditions that ensured this kind of correlation do not exist any longer, this result is virtually insignificant.

To a very large extent, the establishment of the WAMI in 2001 has not occasioned supply shocks synchronicity within the WAMZ. However, mention must be made of the positive and significant correlation between Guinea and Sierra Leone, the only direct neighbours within the Zone. This trend, coming on the back of the end of internal hostilities in Sierra Leone and the restoration of formal trade relations between the two, is very significant in explaining how consistent trade relations with minimal institutional inhibitions can cause countries to experience similar supply shocks. Trade between the two has been increasing consistently since 2001. Proceeding from here, it is obvious that the similarity of supply shocks achieved within this period was not as a result of enhanced monetary policy coordination, which the WAMI was tasked to do, but a pure real sector activity through the channel of trade and commodity price co-movements.

The fact that the rest of the countries have not experienced supply shocks co-movements since 2001, despite the marked macroeconomic stabilization achieved within the Zone points to the differential economic structures in place there. It is not really surprising though, since the

¹¹⁶ Further tests gave correlation coefficients of 0.5 at the 10 percent level (1960-1975) between the two countries. Tests beyond the 1980s were not significant.

¹¹⁷ UNCTAD notes that cocoa production in the early 1970s was concentrated in Ghana, Nigeria, Côte d'Ivoire and Brazil (www.unctad.org/infocomm/anglais/cocoa/market.htm).

countries have seen virtually no change in their structures of production, except for the departure of Nigeria from an agro-based export economy to an oil-propelled industrial export economy in the 1970s. In fact, the countries have grown wider apart with time as a result of continued specialization in the fields of their primary commodities, which are targeted primarily at external export markets, thus, causing them to experience different terms of trade shocks. This bears testimony to the fact that deliberate attempts would have to be made to alter the structures of these economies, since the convergence criteria are not analogous with structural reforms.

Size of Shocks

The size of shocks is also a benchmark in the categorization of a group of countries as being suitable for a monetary union. Ideally, a country that qualifies to join a monetary union must have small-sized shocks, as opposed to large ones, since large shocks tend to be disruptive. Countries with large shocks are better off with an independent rather than a common monetary policy. The size and speed of adjustment of shocks, in Table 5.6, are generated from the accumulated IRFs as suggested by BE. The long-run impact of the supply shock on output (shock2 on GDP), which signifies the shift of the LRAS curve, is taken as the size of the supply shock. This is identified by locating where the accumulated IRF reaches its steady state after the shock. For example, in the case of Ghana, Figure 5.2 indicates that the long-run steady state is reached at the seventeenth horizon and the corresponding figure for the period is 0.065. This represents the size of the supply shock for Ghana. The size of the demand shock, on the other hand, is measured as the sum of the first period responses of both output and prices to the demand shock. Again, from Figure 5.2, that would be the summation of the intercept terms of the graphs which resulted from shock1 on output and inflation (first column graphs).

Table 5.6 Size and Speed of Adjustment to Shocks

Country	Supply Shocks		Demand Shocks	
	Size	Speed	Size	Speed
The Gambia	0.031	0.969	0.068	0.946
Ghana	0.065	0.864	0.127	0.58
Guinea	0.018	0.872	0.094	1.083
Nigeria	0.083	1.166	0.155	0.992
Sierra Leone	0.131	0.688	0.17	1.255
WAMZ Average	0.066	0.911	0.123	0.971
Euro Area Average¹¹⁸	0.03	0.684	0.022	0.417

Source: Author's Calculations

The sizes of the demand shocks are quite large. Sierra Leone's demand and supply shocks are the largest, with The Gambia's demand shocks and Guinea's supply shocks as the smallest. The large sizes of demand and supply shocks in Sierra Leone are not very surprising owing to the devastating effect of the more than a decade-long civil strife which brought economic activity to a virtual halt. Since The Gambia has a relatively low average inflation within the region, the small size of its demand shocks was not unanticipated. Much as it could be argued that Sierra Leone's civil strife is over and it may not experience such disturbing fluctuations again, it seems economically imprudent to constitute a monetary union involving Sierra Leone, The Gambia and Guinea because of the disproportionate sizes of their demand and supply shocks. It must be underscored that the WAMZ's average supply and demand shocks and speed of adjustment are higher than the ones estimated for fifteen EU countries, by BE, before the issuance of the euro.

¹¹⁸ From Bayoumi and Eichengreen (1994)

Speed of Adjustment

As a measure of the speed of adjustment after a demand shock, the accumulated impulse responses after two years over the long-run impacts on output and prices for each country were summed up¹¹⁹. This is because, apart from the fact that the second period sum has been used in other studies, including that of BE, this study found it much more necessary to consider an earlier period of recovery for the WAMZ, since monetary policies in the region have mostly been targeted at short-term rather than long-term goals. This consideration is also necessary because in the event that some countries adjust faster than others, there might be the need for remedial action, such as fiscal transfers, to ease the difficulties of the countries that are not able to recover quickly from such shocks. In case the proposed Stabilization and Cooperation Fund (SCF) has not been fully capitalized, it is going to create problems for the countries that recover slowly.

Sierra Leone's speed of adjustment after the demand shock is the fastest, with Ghana's coming in as the slowest. On the supply side, Nigeria's recovery is the fastest. Sierra Leone, however, manages to recover only about 69 percent of the long-run impact by the second period. Nigeria's speed of adjustment might be a little more worrying than Sierra Leone's (demand shock adjustment) for a number of reasons. The first one is that Nigeria's stature in the WAMZ is so huge that if it runs ahead of the others in restoring equilibrium and is able to tilt monetary policy in its favour while the others are still struggling to catch up, the other countries would be worse off. At this stage, they would have to rely on fiscal transfers (i.e. the SCF) to compensate the other countries. But given the small amount in the Fund (US\$100 million) and how the countries are struggling to raise it, it may not be sufficient to alleviate disequilibria that occur resulting from terms of trade shocks and/or the adverse effects of a common monetary policy.

¹¹⁹ The measure of the speed of adjustment after a supply shock is measured as the ratio of the second period accumulated shock over the long-run supply shock impact of the supply disturbance.

Furthermore, since supply shocks have a long-run impact on output, disruptions in these shocks would be much more troubling than demand shocks. As a result, if Nigeria, the most dominant economy, is not in sync with the other countries on this score, it could adversely affect the stability of the region.

5.2.2 Country-specific, Regional and Global Shocks Model

Following CK, the structural VAR was used in decomposing shocks into country-specific, regional and global shocks using the sum of the United States and the twelve Euro Area countries' GDP as proxy for global GDP. The total WAMZ GDP represents regional GDP, and individual WAMZ countries' GDPs represent country-specific GDPs. Once again, to verify the stability of the model, the various diagnostic tests were conducted as shown in Figure 5.3. Serial correlation and heteroskedasticity tests conducted on the VARs revealed that four out of the five countries' models exhibited stability at the third lag, save that of Nigeria, which was stable at the fourth lag. The residuals did not exhibit serial correlation, but they were heteroskedastic. All of them were estimated using a lag length of three.

Variance Decomposition Analysis of the Country, Regional and Global Shocks

This section analyzes the sources of countries' business cycles using a proxy for global, regional and country-specific shocks to assess whether countries would be better off with independent monetary policies or a collective one. The results, as presented in Table 5.7, point to a near-uniform pattern.

**Figure 5.3 Impulse Response Functions of Output Growth Due to Global Shocks (1)
Regional Shocks (2) and Country-specific Shocks (3) for Nigeria**

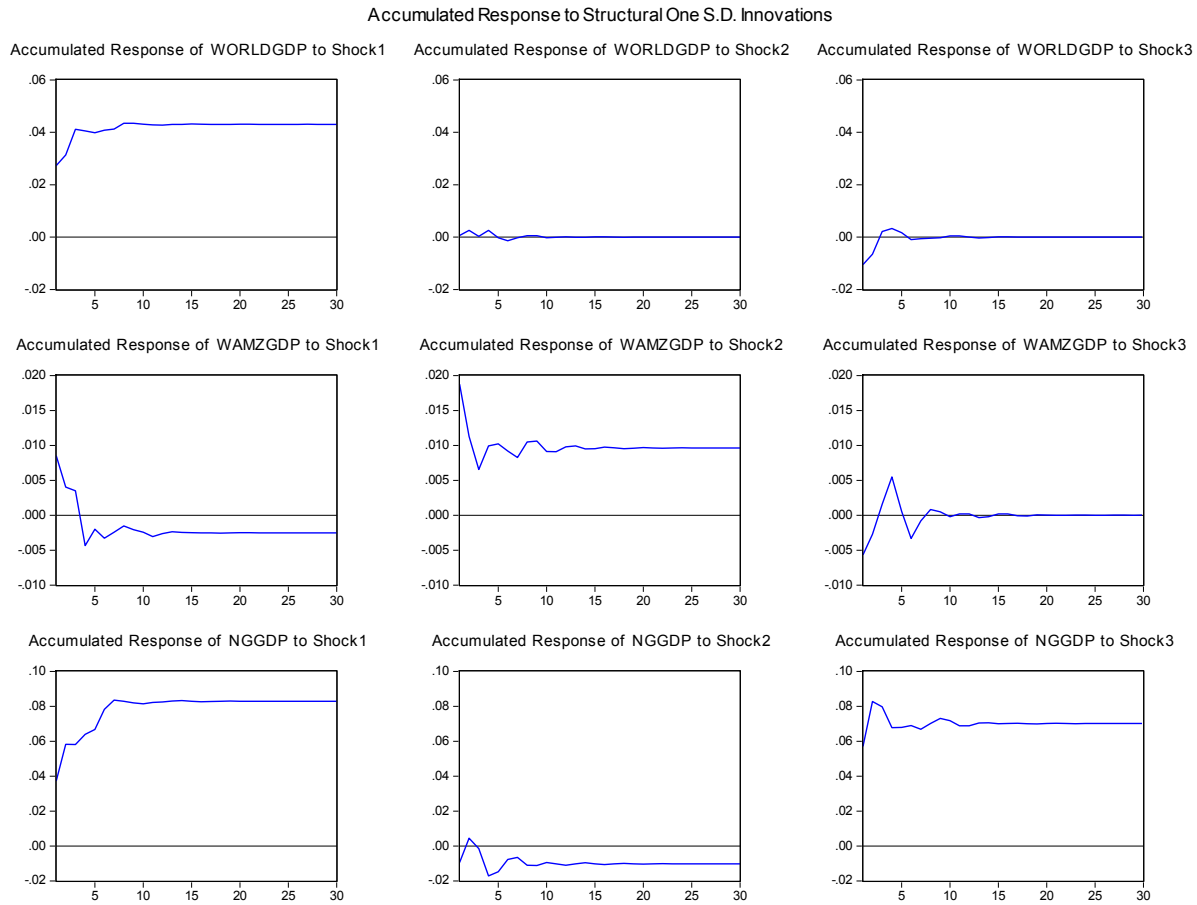


Table 5.7 Variance Decomposition Results

Horizon	Percentage of fluctuations in real output due to:					
	Global Shocks		Regional Shocks		Country Shocks	
	1	5	1	5	1	5
Gambia	4.13	15.59	23.26	20.30	72.61	64.11
Ghana	6.58	12.54	28.69	25.46	64.72	62.00
Guinea	2.43	15.99	11.22	14.17	86.35	69.84
Nigeria	29.15	28.69	1.92	8.78	68.94	62.53
Sa Leone	1.79	4.24	0.11	0.47	98.10	95.29

Source: Author's Calculations

Most of the WAMZ countries' business cycles are caused by country shocks as opposed to global and regional shocks. The story is a little different with Nigeria. As much as 28.89 percent of Nigeria's GDP oscillations were accounted for by global shocks at the end of the fifth horizon from a first period horizon of about 29.15 percent. On the brighter side, at the end of the fifth horizon, domestic shocks had ceded about 5 percentage points mostly to regional, rather than global, shocks¹²⁰. This could be due to the increasing crude oil demand from Nigeria by Ghana over the last six years. In consonance with the regional trade data, Ghana shows a stronger relationship with regional shocks than all the other countries. However, the influence of regional shocks on output oscillations reduces to 25 percent at the end of the fifth horizon. The loss of the regional influence, in addition to the more than 2 percentage points reduction in the country-specific shocks, bolstered global influence on GDP growth for Ghana. The reduction of the influence of Guinea's domestic shocks on output change went largely in favour of global rather than regional, shocks.

The share of regional shocks in explaining output changes in The Gambia is quite impressive. But like the aforementioned countries, it also cedes some country-specific influence to global rather than to regional shocks. Like Ghana, it witnesses a decline in regional influence in favour of global shocks. Even though all the countries exhibit significant country-specific shocks, Sierra Leone's needs to be mentioned since it accounts for more than 95 percent of changes in the country's GDP. Since emerging from the throes of war, the country has witnessed a modest increase in formal trade relations with both the WAMZ and the rest of the world. This could account for the rise in both indices in the fifth horizon.

¹²⁰ This is confirmed by results from the fourth lag model for Nigeria (where the model is much more stable), where regional shocks account for a bigger share of domestic output changes.

A common trend emerges, in that countries are becoming more and more integrated with global rather than regional trends, even though regional shocks have a significant impact on GDP movements in some countries and domestic fluctuations continue to hold sway. As stated in chapter three, the turn of the millennium has brought about increased trade relations with the rest of the world rather than with the WAMZ. This explains why, apart from Nigeria, reductions in country-specific shocks in the other countries have benefitted global rather than regional shocks.

The low influence of regional shocks on Guinea and Sierra Leone's business cycles is not surprising, since their shares of regional trade are negligible. Though Nigeria is the second largest shareholder of regional trade, the share of such trade in its total trade is minimal. The result of the variance decomposition test, therefore, is consistent with trade relationships within the WAMZ. What this means is that generally, the WAMZ countries would be better off with independent monetary policies rather than a common monetary policy, since regional policies may not be able to adequately address country-specific disequilibria.

5.2.3 The Endogeneity Paradigm

The endogeneity of OCA has become a topical issue in discussions on monetary unions. Studies by the European Commission (1990), Frankel and Rose (1998, 2002), Engel and Rose (2002), Rose (2000), Glick and Rose (2002) and many others purport to find that the OCA criteria can be achieved *ex post* and as a result, too much emphasis should not be laid on historical data in assessing the eligibility of a group of countries to form a monetary union. Indeed, in Frankel and Rose's (1998) study, they established that business cycle synchronization may be deepened after the countries begin to abide by the same monetary rules and implement enhanced fiscal policy coordination.

Several other authors, including Masson and Pattillo (2005) and Gulde (2008), maintain that the two CFA zones performed better than the non-CFA countries in sub-Saharan Africa in terms of macroeconomic stabilization, even though the former find that GDP growth was higher in the non-CFA countries than in the CFA zone. On the whole, intra-regional trade within the WAEMU is larger than within the WAMZ, but after more than sixty years of sharing a common currency, intra-regional trade within the WAEMU (which is about 12 percent) is nowhere near that of the Euro Area before the euro notes and coins were issued¹²¹. This is indicative of the fact that the focus has been on external rather than internal trade. It works for the CFA zone because the CFA franc is pegged to the euro (previously to the French franc), a move which bodes well for trade with Europe. But the peg to the French franc became calamitous in the mid-1980s, when the French franc started appreciating, leading to an artificial appreciation of the CFA franc as well, until the peg was adjusted by a 100 percent in 1994.

The succeeding paragraphs assess the performance of the WAEMU in reference to the three endogeneities under consideration – supply and demand shocks endogeneity, price endogeneity and trade endogeneity – as a benchmark for assessing the possible achievement of these endogeneities in the WAMZ.

Endogeneity of Shocks

Applying (4.1), we generated the demand and supply shocks of the WAEMU to ascertain whether its shocks have converged with time. The correlations of demand and supply shocks for the WAEMU (Tables 5.8-5.10) tell us one thing. Yes, the endogeneity effect is real, but thus far it has worked towards synchronizing demand (transitory) rather than supply (permanent) shocks.

¹²¹ The region has quite a sizeable amount of informal trade which could make an impact when formalized. However, it does not compare with the volume of external trade (much of which is recorded).

This confirms the results of a study by Tapsoba (2008), which posited that trade integration in Africa will likely lead to symmetric shocks on the demand side rather than on the supply side. The reason is simple. The enhanced monetary cooperation in the WAEMU has ensured lower inflation, lower public debt and fiscal discipline, but it has failed to alter the structures of the economies in the region. Secondly, because of the continued engagement in the production of primary commodities, intra-regional trade has not been boosted very much after all these years, so the goods are headed for Europe and elsewhere.

As long as the structures of the economies have not changed, the endogeneity effect will only be felt in the monetary rather than the real sector. If that happens, then, the savings on transaction costs argument will have very little effect. As indicated earlier, the commencement of the WAMZ (even without a single currency) has brought some sanity to macroeconomic management in many countries in the region. The period between 2001 and 2006 saw some of the best macroeconomic performances by the WAMZ countries in years. The WAMI was set up in 2001 to help bring this about, and even though favourable commodity prices and resource inflows may have propped up the relative macroeconomic stability that was chalked during the period, the contribution of the WAMI cannot be de-emphasized. However, supply shocks account for the greatest share of business cycles in the region (as shown in Table 5.2), so working towards achieving symmetric demand shocks is not the way to go even though it is a worthwhile point to start from. Since supply shocks are permanent, they should be addressed instead. In many respects the WAMZ is like the WAEMU, since its focus has been on external trade. What this means is that supply shocks synchronization may take a similar pattern as the WAEMU and intra-WAMZ trade will not increase that much.

Finally, Tables 5.8 and 5.9 also show us that an enlarged monetary union involving the WAEMU and the WAMZ may not be in the interest of most of the countries, since they share idiosyncratic shocks. As indicated earlier on, the plan is to merge the WAMZ and the WAEMU after the successful operation of the WAMZ. However, given that the WAEMU and the WAMZ have asymmetric shocks and the fact that the combined shocks of the two are no different, a little more time may be required to work on their respective production and export structures until a time when they become symmetric. Demand shocks synchronicity will follow naturally after they adhere to common monetary policies.

Table 5.8 Correlation of WAMZ and WAEMU Supply Shocks (including Guinea)

	Gambia	Ghana	Guinea	Nigeria	Sa Leone	Benin	B. Faso	C. d'Ivoire	G. Bissau	Mali	Niger	Senegal	Togo
Gambia	1												
Ghana	-0.01	1											
Guinea	-0.23	-0.19	1										
Nigeria	0.01	0.04	0.1	1									
Sa Leone	-0.12	-0.16	0.02	-0.1	1								
Benin	-0.08	-0.12	-0.18	-0.07	0.04	1							
B. Faso	-0.06	0.05	0.2	0.28	0.05	-0.17	1						
C. d'Ivoire	-0.18	-0.01	0.25	-0.15	-0.14	0.22	0.12	1					
G. Bissau	-0.1	0.17	-0.17	-0.28	-0.16	-0.25	-0.06	0.04	1				
Mali	0.49**	0	-0.23	-0.33	-0.03	-0.43**	0.24	-0.2	0.17	1			
Niger	-0.1	-0.2	0.41**	0.59*	0.17	-0.27	0.73*	0.08	-0.39***	-0.04	1		
Senegal	0.36***	-0.02	-0.12	0.08	0.04	-0.29	0.34	-0.24	-0.34	0.38***	0.31	1	
Togo	-0.21	-0.03	-0.05	0.05	-0.25	0.3	0.06	0.44**	0.2	-0.19	-0.11	-0.22	1

Source: Author's Calculations

*significant at 1 percent level

**significant at 5 percent level

***significant at 10 percent level

NB: WAMZ is in bold

Table 5.9 Correlation of WAMZ and WAEMU Supply Shocks (excluding Guinea)

	Gambia	Ghana	Nigeria	Sa. Leone	Benin	B. Faso	C. d'Ivoire	G. Bissau	Mali	Niger	Senegal	Togo
Gambia	1											
Ghana	-0.23	1										
Nigeria	-0.32***	0.39**	1									
Sa. Leone	-0.16	-0.01	0.05	1								
Benin	-0.40**	0.21	0.19	0.09	1							
B. Faso	-0.21	0.16	0.40**	0.07	0	1						
C. d'Ivoire	-0.13	0.04	0.18	-0.14	0.08	0.33***	1					
G. Bissau	0	-0.06	-0.24	-0.16	-0.25	0.01	0.15	1				
Mali	0.31	0.08	0.1	-0.07	-0.35**	0.18	0.09	0.12	1			
Niger	-0.22	0.18	0.46*	0.2	-0.01	0.64*	0.19	-0.29	0.02	1		
Senegal	-0.06	-0.17	0.38**	0.01	-0.01	0.47*	0.23	-0.18	0.34**	0.16	1	
Togo	-0.06	0.26	0.07	-0.18	0.2	0	0.2	0.1	-0.15	-0.01	-0.29	1

Source: Author's Calculations

Table 5.10 Correlation of Demand Shocks for the WAEMU

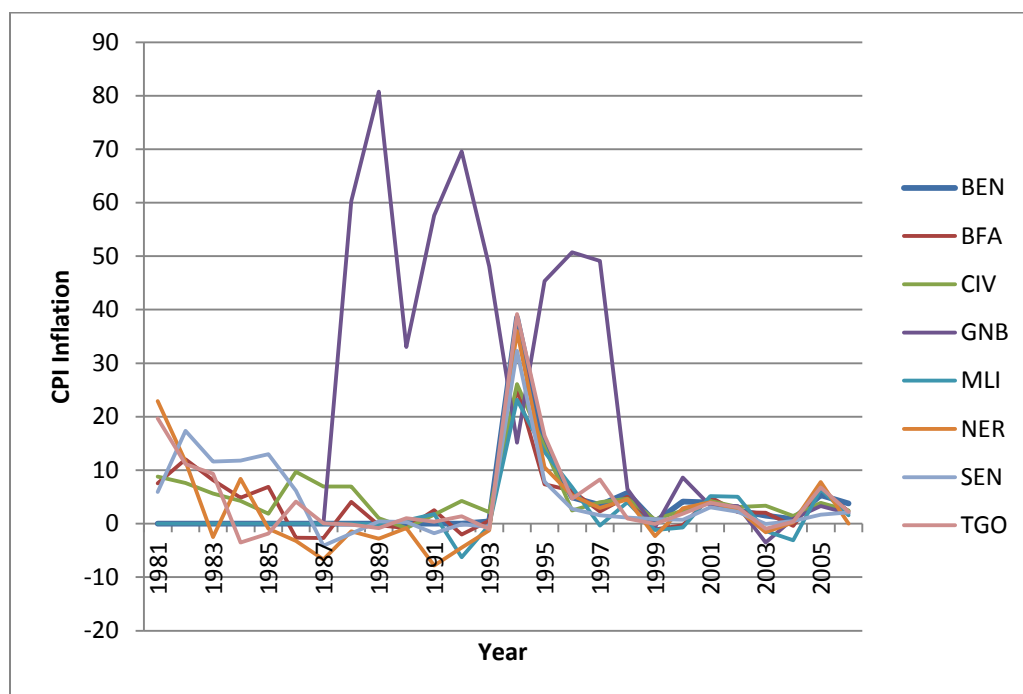
	Benin	B. Faso	C. d'Ivoire	G. Bissau	Mali	Niger	Senegal	Togo
Benin	1							
B. Faso	0.58*	1						
C. d'Ivoire	0.54*	0.58*	1					
G. Bissau	-0.21	-0.23	-0.05	1				
Mali	0.66*	0.55*	0.42*	-0.24	1			
Niger	0.64*	0.63*	0.78*	0.08	0.46*	1		
Senegal	0.68*	0.66*	0.74*	-0.14	0.62*	0.73*	1	
Togo	0.37**	0.53*	0.53*	-0.07	0.27	0.40**	0.55*	1

Source: Author's Calculations

Price Endogeneity

Prices in the WAEMU seem to have converged, as can be inferred from Figure 5.4. It is interesting to note that price convergence within the Zone became much more visible from 1994. Incidentally, this was when the CFA franc was devalued and relatively strict monetary policies were instituted and enforced. Before the devaluation, the big players in the Zone circumvented the monetary rules that were in force at the time. Guinea-Bissau (GNB) represents an interesting case. The trend indicates that since it joined the WAEMU in 1997, its price has converged with those of the other member states. This goes to attest to the notion that the adherence to common monetary rules has the tendency of ensuring price convergence *ex post*.

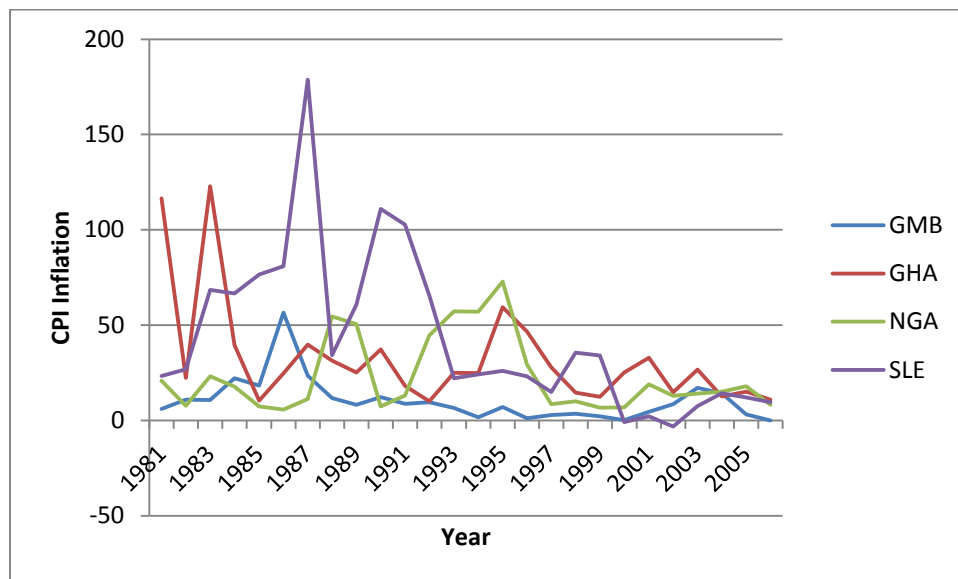
Figure 5.4 Price Movements in the WAEMU



Source: World Development Indicators CD-ROM (2008)

In contrast to the WAEMU, the WAMZ shows very little indication of price co-movement. This can be attributed to the lack of an institutional authority to ensure compliance with monetary rules. Furthermore, because there is no single regional monetary policy, the countries still formulate their own policies, thus, making convergence difficult. It must be stated, however, that even though the WAMI does not have enough authority to enforce agreed principles, the Zone has begun to experience a semblance of convergence with prices beginning to stabilize and co-move. This could be attributed to the dedication of the countries to improve their performances after they realized that the January 2005 deadline for the issuance of the single currency would not be possible.

Figure 5.5 Price Movements in the WAMZ



Source: World Development Indicators CD-ROM (2008)

The WAEMU has shown that price co-movement can be achieved *ex post*, and since the WAMZ itself has shown flashes of this feat, as shown in Figure 5.5, it is a fact that adherence to common monetary policies can help reduce and stabilize prices.

Trade Endogeneity

The model [i.e. (4.27)] was first estimated using the random effects specification, in order to capture the effects of the time-invariant variables – distance, area, colonizer and border. Having estimated this specification, the Hausman test was used to verify the presence, or otherwise, of the fixed effect with any of the variables. The test confirmed the existence of a correlation between the fixed effect and some variables, thus, making it difficult to ignore such effects. As a result, the study dwells on the fixed effects model in explaining the effect of the CFA franc on trade, as depicted in the table below.

Table 5.11 The Gravity Model Results

Dependent Variable: Trade		
	Fixed Effects	Random Effects
GDP	1.83 (0.00)	1.83 (0.00)
Distance		-1.3 (0.00)
Area		-0.51 (0.00)
Border		0.55 (0.06)
Colonizer		0.95 (0.00)
CFA	0.30 (0.02)	0.45 (0.00)
CFA94	-0.40 (0.00)	-0.43 (0.00)
WAMI	-0.58 (0.00)	-0.58 (0.00)
Constant	-30.66 (0.00)	-22.13 (0.00)
R-squared	0.81	0.60

Source: Author's Calculations

NOTE: Figures in parenthesis are probability values. Hausman test results are shown in Appendix 11.

The results confirmed pre-regression expectations about *GDP*, *Area*, *Distance* and *Colonizer*. Income growth enhances trade; the larger the land area, the more costly it is to

export goods; the longer the distance between two countries, the less trade will take place between them. Finally, *Colonizer*, which is also representative of common language, had the right sign. Countries tend to move together on colonial lines, as exhibited by the WAEMU, which is mainly a Francophone group.

The coefficient of *WAMI* is found to be negative. This means that the establishment of the WAMI in 2001 has not fostered intra-regional trade in the WAMZ, despite it ensuring macroeconomic stability. On the other hand, the use of the CFA franc is found to have enhanced trade within the WAEMU. The true size of the coefficient, using the random effects specification, is $(e^{0.45} - 1) \approx 0.57$ while the fixed effect specification gives $(e^{0.3} - 1) \approx 0.34$ ¹²². Given our initial findings that the fixed effect is correlated with the explanatory variables, the fixed effect specification result is used. In effect, the common currency in the WAEMU is estimated to have increased trade by approximately 34 percent in comparison with the WAMZ. However, *CFA94* was negative. *CFA94* is a dummy variable, which is one beginning from 1994 to 2006 for all WAEMU members and zero otherwise. The coefficient means that the 1994 devaluation of the CFA franc has not facilitated trade within the Zone. It is not surprising since the devaluation was done in order to ensure the competitiveness of the WAEMU countries' commodities on the international market – mostly Europe. In essence, it is safe to say that the WAEMU was much more effective in triggering internal trade in the period before 1994 than after it.

Since the border effect was positive and significant, the WAMZ cannot take the significant impact of the CFA franc on intra-regional trade for granted because the

¹²² Since the CFA variable was not logged, but the Trade variable was, the true coefficient is found by taking the antilog of its coefficient. Refer to Wooldridge (2003) for details.

WAMZ is geographically disjointed compared with the WAEMU. This could also mean that the WAMZ countries trade more with the WAEMU members with whom they share common borders, a truth that is further solidified by the positive coefficient of the distance variable.

In keeping with the Rose (2000) model, the study explored the impact of GDP per capita on the model. The result was not quite what was anticipated, as the variable turned out to be negative (results shown in Appendix 11). However, its inclusion improved some of the other variables such as the border effect, *Colonizer* and *Distance*, while worsening the impact of land area on bilateral trade. The currency union effect reduced to approximately 25 percent for the fixed effects model and 51 percent for the random effects model. In all, this model is consistent with the results in Table 5.11 since the signs of the coefficients remained the same, an indication that the core estimable variables are robust.

On the endogeneity of the other macroeconomic variables, the classical example of the CEMAC shows that even if trade is not endogenous, the adherence to common monetary rules makes it possible for countries to achieve convergence of prices¹²³. Nevertheless, we must not be oblivious of France's role in ensuring that the countries adhere to laid down rules through strict supervision, something the WAMZ does not have. The question arises as to how disciplined the WAMZ countries will be in playing by the rules of the proposed West African Central Bank.

¹²³ Even though the CEMAC now has a relatively stable macroeconomy, the *WDI* (2007) indicates that intra-regional trade has been on the decline. From 2.3 percent in 1990, it declined to 1.3 percent in 2004 and 0.9 percent in 2005. This is mainly due to the increasing oil exports, which are mostly destined for the outside market (chapter 3 sheds more light on the impact of the oil find).

5.2.4 Introducing Liberia

With the accession of Liberia into the WAMZ on February 16, 2010, it has become imperative that the country be included in the analyses. The results, inclusive of Liberia, can be seen in Appendix 12. It was found that supply shocks account for 99.50 percent of business cycles with demand shocks (66.07 percent) as the main source of price fluctuations (Appendix 12A) in Liberia. It was also found that neither of Liberia's supply nor demand shocks had a positive and significant correlation with any of the other countries' shocks; and it had the largest demand and supply shocks sizes and the slowest adjustment speed (except for its demand shocks, which is second from the bottom after Ghana's) in the WAMZ (Appendices 12B-12E). Furthermore, Liberia's business cycles respond better to domestic shocks (81.67 percent) than to global shocks (14.32 percent) or regional shocks (4.01 percent) as shown in Appendix 12F. All of the above are in keeping with the earlier results in this chapter.

The gravity model results (including Liberia), on the other hand, alter a few things considering the fact that it added a further 235 observations to the data. First of all, it was previously assumed that *Colonizer* was equivalent to *Language* (and that was accurate considering the countries involved). That does not work with Liberia because even though its lingua franca is English, it was never colonized by the British as were the other English-speaking West Africans. As a result, the data had to be adjusted to introduce *Language* as one of the regressors. With the two in the model, the former would turn negative and the latter, positive. However, they were both positive when either one of them was dropped. Finally, the model with *Language* (and no *Colonizer*) was settled upon and the results (in Appendix 12G) preserved the earlier gravity model results in this

chapter, in addition to establishing a positive relationship between per capita GDP and bilateral trade (Appendix 12H). What is of much significance to this study is the fact that, the new gravity model sensationally ascribes a common currency effect of 232 percent (without GDP per capita) and 203 percent (with GDP per capita) to the CFA franc over the WAMZ, using the fixed effects specification, an indication that the common currency effect is likely to increase once a non-CFA member is introduced.

5.3 Concluding Remarks

This chapter set out to estimate the models specified in chapter four by way of confirming the *ex ante* and *ex post* theories of monetary unification in the WAMZ and the WAEMU respectively, and using the results to assess the feasibility of a monetary union for the WAMZ. The results indicate that the WAMZ is not integrated well enough to form a monetary union based on the analyses of demand and supply shocks. It was found that demand as well as supply shocks are not correlated, and the sizes of such shocks are so large that they can destabilize the region. Furthermore, it was established that the WAMZ's business cycles are determined largely by domestic factors rather than regional factors and that there is a gradual identification with global shocks at the expense of regional shocks, indicating individualism, incipient globalization and less regionalism.

On endogeneity, the study found that the WAEMU has achieved price stability as the WAMZ continues to struggle with the same. It also establishes that the WAEMU is largely synchronized when it comes to demand shocks but experiences idiosyncratic supply shocks, an indication that the monetary union has fostered the convergence of monetary rather than real sector activities such as production and export structures. This,

the chapter concludes, is detrimental to the well-being of the monetary union since supply shocks synchronicity is much more important than demand shocks synchronicity. On trade endogeneity, the study found that the WAEMU has been able to increase internal trade owing to the use of a single currency as compared to the WAMZ, which still uses multiple currencies, and to a large extent foreign currencies to conduct intra-regional trade. However, the chapter concludes that this advantage, which has come about as a result of the use of a single currency, may not be easily achieved in the WAMZ because of the fact that the same model stresses the importance of geographical locations in intra-regional trade. Since the WAMZ is largely disjointed, it may be faced with the challenge of the border effect even after monetary unification.

The results, inclusive of Liberia, corroborated the earlier results. Liberia's inclusion did not change the *ex ante* results. It confirmed that the WAMZ's business cycles are influenced primarily by domestic rather than regional factors. It also showed that Liberia does not have supply shocks co-movement with the rest of the WAMZ, an indication that the WAMZ does not have enough grounds to form a monetary union. On the other hand, Liberia's inclusion in the gravity model increased the monetary union effect on trade by a multiple fold, thus, confirming the *ex post* trade enhancement notion.

Based on the above, the chapter concludes that it may not be advisable for the WAMZ to form a monetary union since the *ex ante* analyses have shown that it is not integrated well enough, and the *ex post* analyses show that a lot of effort needs to be put in as regards shocks synchronization and overcoming its geographical challenges by activating the ECOWAS protocols on the free movement of goods and people to facilitate trade in the region.

Chapter Six

Alternative Exchange Rate Arrangements

6. Introduction

This chapter analyzes some alternative exchange rate options available to the WAMZ in the face of the asymmetric demand and supply shocks and the fact that it might not be able to achieve trade and supply shocks synchronicity endogenously. The chapter takes a second look at the issue of exchange rate arrangements (as discussed in chapter 2) all over again to see whether any of them could be a worthwhile alternative to monetary unification. It lays particular emphasis on such options as regional target zones based on local currencies and on a foreign currency anchor.

6.1 An Exchange Rate Union

Consequent to the *ex ante* and *ex post* results in chapter 5, the study moves to consider alternative ways by which some, if not all, of the benefits of monetary union could accrue to the WAMZ since the monetary union route has been proven to be far-fetched. This chapter considers an exchange rate union based on regional currencies and also based on an external currency anchor. This is because, as discussed earlier on, this option combines the characteristics of both the firm fix and flexible exchange rate regimes; and the fact that it is not seen as a perpetual arrangement for the WAMZ (in this study) will further deter speculators from a region which is already considered too risky an environment for speculative capital to thrive.

Even though this kind of arrangement cannot eliminate transaction costs as a full monetary union would, when combined with a full currency convertibility regime, it can

reduce the high transaction costs associated with the use of hard currencies as the means of payment for goods and services in the region, while at the same time stabilizing the macroeconomic environment. In addition to guaranteeing most of the other benefits of monetary unions, this arrangement ensures that the countries retain a semblance of monetary policy independence, albeit limited, unlike in full monetary unions.

6.1.1 An Exchange Rate Union with No External Currency Anchor

The study includes the real exchange rates (RERs) of the respective countries in the model in (4.1) to delineate shocks into demand, supply and real exchange rate shocks [as expressed in (4.28)] in order to ascertain whether their real exchange rates are positively and significantly correlated for a possible currency basket involving only regional currencies. The results, as indicated in Table 6.1, imply that the countries have asymmetric real exchange rate shocks. Once again, owing to data unavailability, Guinea was excluded at some point, and the resultant relationships indicated that Sierra Leone had positive and significant correlations with Ghana and The Gambia at the 5 percent level – this is in consonance with the correlation of real exchange rate (at levels) of the countries as shown in Appendix 5. However, this does not indicate a clear pattern of shocks co-movement since The Gambia and Ghana do not have a positive and significant correlation between them.

Table 6.1 Correlation of Real Exchange Rate Shocks

	With Guinea					Without Guinea			
	Gambia	Ghana	Guinea	Nigeria	Sa Leone	Gambia	Ghana	Nigeria	Sa Leone
Gambia	1					1			
Ghana	0.30	1				0.24	1		
Guinea	0.16	-0.10	1						
Nigeria	0.10	0.16	0.35	1		0.26	0.12	1	
Sa Leone	0.23	0.32	0.30	0.20	1	0.35**	0.38**	0.25	1

** significant at the 5 percent level

Because no clear exchange rate union pattern emerges for the five countries, the study falls short of recommending the investiture of an arrangement that would seek to fix the exchange rate among the countries in a currency basket regime. This takes us to the next exchange rate option.

6.1.2 An External Currency Anchor-type Exchange Rate Union

Conventionally, the anchor currency for any regional exchange rate arrangement should be the currency of an economically influential country that has fiscal and monetary discipline as its hallmark in the region – like the Deutsche mark of Germany in the case of Europe. In terms of economic size, that currency should be the Nigerian naira but because of its history of economic instability, it does not qualify to be accorded this responsibility. Neither does Ghana, nor any of the other economies. The Gambia could have been an ideal candidate as an anchor country based on its relative economic stability, however, it is not a big enough economy (as measured by economic size and the share of intra-regional trade) to take up this mantle.

In light of this, the study considers two global currencies belonging to two major regions the WAMZ trades with, the United States and the EU, as anchors. It proceeds by extending the BE methodology to 4 variables, as indicated in (4.41). Two separate

scenarios are analyzed in this model. The first one analyzes the effects of domestic individual WAMZ countries and the United States' shocks on the respective WAMZ countries' business cycles and price changes. The second one replaces the United States' shocks with those of the twelve Euro Area countries, with Germany's price used to represent the twelve Euro Area countries' price. This is in view of the fact that Germany's monetary policy was adopted as the standard for the EMS in the run-up to the EMU.

The variance decomposition test results in Table 6.2 (the first scenario) show that the WAMZ countries generally respond favourably to domestic shocks rather than shocks emanating from the United States. However, the results indicate that when it comes to the causes of business cycles, even though domestic supply shocks dominate, US demand shocks are stronger than domestic demand shocks both in the medium (fifth horizon) and long-terms (tenth horizon). Furthermore, US demand shocks are stronger than its supply shocks in determining changes in output in all the WAMZ countries, except for Guinea. This bears testimony to the influence of the US dollar on these economies. This is not too surprising in a region where government contracts and real estate prices, among others, are mostly quoted in dollars and the citizens, to a very large extent, prefer to hold the dollar to their respective currencies as a store of value. It also indicates that US monetary policies, rather than its export structures, have a greater impact on the WAMZ with respect to output changes. Since most raw materials are bought in dollars and prices of most exports are quoted in dollars, exchange rate swings affect domestic output changes more than changes in US output does. To a very large extent, the citizens prefer to hold the dollar to their respective currencies as a store of value.

Again, US supply shocks have a stronger influence on price changes in three of the countries – The Gambia, Ghana and Nigeria – than their respective domestic supply shocks. However, the dollar does not have enough influence on these economies to qualify as a plausible anchor currency.

Table 6.2 Variance Decomposition Test with the US Dollar as a Currency Anchor

Business cycles due to:						Price changes due to:					
		U.S. Supply S.E.	U.S. Demand Shocks	Domestic Supply Shocks	Domestic Demand Shocks			U.S. Supply Shocks	U.S. Demand Shocks	Domestic Supply Shocks	Domestic Demand Shocks
Gambia											
1	0.016	2.31	8.36	88.98	0.34	0.009	0.00	0.07	3.22	96.71	
5	0.021	3.56	10.74	82.12	3.58	0.012	11.33	3.43	9.36	75.88	
10	0.021	3.62	10.74	81.95	3.69	0.012	11.37	3.65	9.68	75.30	
Ghana											
1	0.017	3.77	32.53	59.35	4.34	0.008	9.29	33.03	2.80	54.88	
5	0.021	18.27	21.71	50.65	9.37	0.012	13.95	47.33	7.33	31.39	
10	0.022	19.44	21.44	49.45	9.67	0.012	12.66	47.18	11.07	29.09	
Guinea											
1	0.010	14.49	1.98	83.25	0.27	0.005	1.26	3.79	77.12	17.83	
5	0.014	15.79	11.82	67.85	4.54	0.006	1.78	12.07	67.99	18.17	
10	0.014	15.83	11.92	67.72	4.54	0.006	1.94	12.26	67.66	18.14	
Nigeria											
1	0.017	0.01	10.55	88.79	0.65	0.009	7.94	1.30	0.28	90.48	
5	0.021	4.88	21.52	70.90	2.71	0.012	12.06	1.18	4.16	82.60	
10	0.022	5.43	21.41	70.40	2.76	0.012	12.60	1.23	4.17	82.00	
Sa Leone											
1	0.018	16.19	12.59	64.55	6.68	0.009	0.00	7.99	0.00	92.01	
5	0.021	12.68	20.19	57.53	9.60	0.012	4.41	7.08	7.04	81.47	
10	0.022	12.75	20.16	57.50	9.59	0.012	5.24	7.31	7.08	80.36	

Source: Author's Calculations

It suffices to say that the US economy has a telling impact on the Ghanaian economy, with aggregate shocks accounting for more than 40 percent of the country's output fluctuations. The same could be said of price fluctuations, which are usually caused by domestic factors. Here again, Ghana stands out as an economy that is heavily

influenced by the US economy, with a combined effect of US demand and supply shocks of over 60 percent. This is empirically tenable in the Ghanaian economy as prices are mainly determined by two factors – oil prices and the cedi-dollar exchange rate¹²⁴.

A WAMZ exchange rate arrangement with the euro as an anchor does not seem like a plausible anchor currency alternative either (as shown in Table 6.3). Once again, domestic shocks are stronger in accounting for business cycles and price changes. However, it must be said that the Euro Area performs much better in explaining business cycles in the WAMZ than the US dollar because European shocks do better than the dollar in explaining business cycles in three of the five countries – The Gambia, Guinea and Nigeria.

However, the decision as to which of the two countries' currency should be used as an anchor rests mostly on the influence the country's supply shocks have on individual WAMZ countries' business cycles (at least, in a permanent exchange rate arrangement). Here again, we see that the countries are divided on this score. As a result, an exchange rate arrangement with either the euro or the dollar as an anchor currency on a long-term basis is not advisable. That notwithstanding, if the countries seek to move gradually into the monetary union programme by instituting an exchange rate mechanism to help stabilize their various economies, as the Euro Area did, the euro would be the better of the two currencies. This is because out of the two, the WAMZ's business cycles respond better to the Euro Area's supply shocks than those of the United States. Furthermore, the recent instability of the dollar, coupled with the fact that it could lose its international appeal in view of the huge debts and budget deficits in the US which have raised fears of

¹²⁴ Asenso (2008) established that the cedi equivalent of the three major foreign currencies in Ghana – the US dollar, the euro and the pounds sterling – are largely influenced by the cedi price fluctuations of the dollar.

monetization, make the euro more reliable going forward than the dollar in any exchange rate stabilization scheme.

Table 6.3 Variance Decomposition Test with the Euro as a Currency Anchor

		Business cycles due to:					Price changes due to:				
		E.U.	E.U.	Domestic	Domestic		E.U.	E.U.	Domestic	Domestic	
		Supply	Demand	Supply	Demand		Supply	Demand	Supply	Demand	
		S.E.	Shocks	Shocks	Shocks	S.E.	Shocks	Shocks	Shocks	Shocks	Shocks
Gambia											
	1	0.011	10.08	13.41	66.61	9.89	0.009	1.43	2.75	0.12	95.7
	5	0.014	11.06	13.44	63.64	11.86	0.011	8.94	2.60	0.53	87.93
	10	0.014	11.07	13.43	63.60	11.89	0.011	9.00	2.59	0.54	87.87
Ghana											
	1	0.012	0.29	26.45	73.05	0.20	0.009	1.93	5.36	0.92	91.78
	5	0.014	3.34	22.72	73.66	0.29	0.011	1.67	5.50	27.30	65.53
	10	0.014	3.34	22.72	73.66	0.29	0.011	1.67	5.50	27.33	65.50
Guinea											
	1	0.008	8.59	1.85	83.75	5.81	0.008	13.43	2.27	41.37	42.92
	5	0.012	18.93	1.82	69.37	9.87	0.01	14.52	4.63	43.05	37.8
	10	0.012	18.94	1.83	69.37	9.87	0.01	14.52	4.63	43.05	37.8
Nigeria											
	1	0.012	7.6	10.08	80.19	2.13	0.009	6.29	13.01	13.55	67.14
	5	0.014	11.25	11.02	72.9	4.82	0.011	7.04	12.04	13.69	67.22
	10	0.014	11.26	11.02	72.89	4.83	0.011	7.06	12.04	13.69	67.21
Sa Leone											
	1	0.012	3.25	2.95	87.58	6.22	0.009	1.48	3.77	0	94.75
	5	0.014	6.04	14.01	71.23	8.72	0.011	1.69	3.95	2.95	91.41
	10	0.014	6.05	14.01	71.23	8.72	0.011	1.69	3.95	2.95	91.41

Source: Author's Calculations

From the above results, it is obvious that the WAMZ is influenced by the Euro Area's supply shocks more than US shocks, but domestic shocks are the strongest causes of price and output changes. The study suggests that an exchange rate arrangement with the euro as the anchor currency will better serve the stabilization objective of the

WAMZ¹²⁵. This would also ascribe both monetary and fiscal discipline on the countries so they can gradually move towards the monetary union objective. This is in view of the fact that a floating exchange rate regime will make it difficult for the countries to collectively achieve the convergence criteria, as has been the case thus far.

One of the worries of researchers concerning such arrangements and the intermediate exchange rate arrangements is that they are subject to speculative attacks (as occurred in Asia in 1997) – which could destabilize the arrangement. However, the financial system in the WAMZ is not that well developed and since the study recommends that any such arrangement should be in the medium term, this is unlikely to happen. Any such arrangement should take more than five years, but no more than ten years, and should run concurrently with intra-regional trade deepening policies.

It must be stated that this arrangement, which is supposed to usher the countries into a monetary union, will not be successful if the countries do not seek a deeper cooperation with the WAEMU by establishing a customs union and enhancing trade within the region. This will ensure that they lay the building blocks towards achieving shocks co-movement. As has been established in chapter 5, West African countries tend to trade more with their direct neighbors, thus, explaining why trade in the WAMZ is so low. By activating the ECOWAS protocols on the free movement of goods and persons, they would be enhancing trade within the WAMZ, and by extension the West African sub-region. As has already been said, trade integration has the tendency of causing countries to experience shocks co-movement.

¹²⁵ The dollar was suggested as the anchor currency in the ERM by the WAMI in the early years of the plan to form a monetary union. This is understandable because at the time, the euro was in its teething stages and could not have been relied upon.

6.1.3 Introducing Liberia

The inclusion of Liberia in the exchange rate analysis with no external anchor (Appendix 12I) was no different from the result in Table 6.1. Proceeding to the external anchor currency analyses (Appendix 12J and 12K), it was found that the inclusion of Liberia solidifies the case for the euro as the preferred currency in the proposed ERM. The Euro Area performs much better in explaining business cycles in the WAMZ than the US dollar because European supply shocks do better than the dollar in explaining business cycles in four of the six countries – The Gambia, Guinea, Liberia and Nigeria – with European combined shocks accounting for more than 55 percent of Liberia’s business cycles, as indicated in Appendix 12I.

6.2 Concluding Remarks

This chapter finds that, like demand and supply shocks, exchange rate shocks in the WAMZ do not co-move either. As a result, an exchange rate arrangement in the mold of the EMU would not be feasible. We therefore went on to test the possibility of an anchor currency in an exchange rate arrangement by assessing the eligibility of the US dollar and the euro for this role. It was established that the countries are impacted more by domestic shocks than by external shocks in both cases, but to better prepare the countries for the planned monetary union, we recommend that the euro be adopted as an anchor in an exchange rate mechanism to help stabilize the exchange rate and other macroeconomic indicators in the intervening period. This is because their business cycles respond better to European supply shocks than to American shocks.

We argue that an exchange rate arrangement with the euro as the anchor currency will better serve the stabilization objective of the WAMZ. This would also ascribe both monetary and fiscal discipline on the countries so they can gradually move towards the monetary union objective.

Chapter Seven

Summary of Conclusions and Recommendations

7. Introduction

This chapter brings closure to the study by summarizing all the study findings, pre-and-post regression, and postulating appropriate recommendations based on the findings.

7.1 Summary of Conclusions

7.1.1 Pre-regression Analyses

The study, in the third chapter, revealed that the WAMZ's population of approximately 188 million is high and above the combined population of both the WAEMU and the CEMAC (which is approximately 135 million), thus, increasing the chances of internal trade. However, this has not been the case, as intra-regional trade hovers around the 2.3 percent level as opposed to 12 percent in the WAEMU, for instance. This could be attributed to the production of commodities that are less desirable by member countries than by developed countries. One other reason has to do with geography. Since the WAMZ countries are disjointed, exports to other fellow WAMZ countries pass through some WAEMU countries, with its attendant cost implications in the form of transportation and the payment of bribes at the borders. Finally, owing to the fact that most intra-regional trade is conducted in foreign currencies, it is much more profitable for countries to trade with countries that can pay more and readily supply such foreign currency than with the WAMZ countries. These serve as a disincentive to trade.

The GDPs of the countries are largely disproportional, with Nigeria accounting for more than 81 percent and The Gambia coming in with 0.2 percent. It was also found that on the whole, the CFA zone countries have achieved better stability than the WAMZ in terms of prices and growth, owing to the pursuit of prudent monetary and fiscal policy policies.

It was also revealed that the political will to form the monetary union in the WAMZ is far more credible than what obtained in the pre-WAMZ era monetary union, which was targeted at a West Africa-wide monetary union. That notwithstanding, the delay of the issuance of the single currency cannot be pinned to economic factors alone, but politics as well. The countries have reneged on their commitment to capitalize the Stabilization and Cooperation Fund, failed to check government expenditure and failed to stabilize their currencies.

It is also clear that the WAMI lacks authority in many respects. The Institute has not been able to impress on countries to conform to agreed decisions because it lacks real authority to do so. As a result, there is no system of rewards and punishments in place to encourage members that are consciously meeting the targets and to deter others from contravening these targets. Naturally, countries are more inclined to respond readily to their internal challenges than to adhere to the WAMI's targets. In this light, the WAMZ does not have any credible institution in place to ensure that set targets are met.

One of the ways to strengthen a monetary union is through the institution of an economic union or a customs union. This is because it facilitates internal trade through the imposition of common external tariffs, thus, discouraging the importation of goods from without the zone. ECOWAS is an economic union in principle, but this is not the

case in practice. A paltry 0.5 percent external tariff has been in place for a while, even though internal tariffs have been virtually eliminated. At best, ECOWAS, and for that matter, the WAMZ, can be described as a free trade area. A common external tariff system that has existed for some time now is yet to be implemented to the letter in the WAMZ.

7.1.2 Post-regression Analyses

The models in the study address three themes – *ex ante* OCA, *ex post* OCA (or endogeneity) and an alternative exchange rate option. Whilst the *ex ante* OCA approach sought to verify the presence of common shocks in the WAMZ, the *ex post* OCA approach was dedicated to confirming the presence of demand and supply shocks synchronicity in the WAEMU, price convergence in the WAEMU and a single currency-induced intra-regional trade inducement in the WAEMU in comparison to the WAMZ. The alternative exchange rate option, on the other hand, sought to ascertain the suitability of an exchange rate mechanism with either domestic or foreign currencies as an anchor.

Ex Ante OCA

The study employed the BQ model to decompose shocks into demand and supply shocks to ascertain whether the correlations of the respective countries' demand and supply shocks exhibited shocks synchronicity. The results indicated that the demand shocks for the full sample period were insignificant, indicating shocks asymmetry for the five countries. The SAP, pre-SAP and decade-by-decade correlations were also largely insignificant, with just a few positive and significant correlation coefficients. The same

was the case for the correlations of supply shocks. The full sample results indicated the presence of idiosyncratic shocks, with a single positive and significant correlation between Ghana and Nigeria's supply shocks after Guinea had been dropped, owing to its data limitation. However, the decade-by-decade correlations indicated that this positive correlation prevailed in the past, since the situation was different beyond 1989. One interesting finding was that Nigeria was a major producer of cocoa up until 1975, when oil exports dwarfed its cocoa sector, making it lose common shocks with Ghana. Another note of interest is the fact that Sierra Leone and Guinea experience a positive and significant supply shocks coefficient in the post-WAMZ era which is indicative of supply shocks synchronicity.

The study found that supply shocks have the strongest influence on output changes and demand shocks have the strongest influence on prices. The study also found that the size of the WAMZ's average demand and supply shocks were large and potentially destabilizing since it is larger than the euro average as provided by BE. Apart from this, the individual countries' shocks were almost always larger than those of their counterparts in Europe. On a positive note, the WAMZ countries recover faster from shocks than their European counterparts.

A variant of the BQ model, as used by CK, was employed to decompose shocks into country-specific, regional and global shocks to assess their impact on business cycles in the WAMZ. The findings indicated that the countries are largely affected by domestic shocks rather than regional shocks. It was also realized that regional and country-specific shocks are shedding shares in favour of global shocks. This indicates that the countries have peculiar shocks, as a result of which a common monetary policy may be

destabilizing. Furthermore, the ever-increasing trade with the rest of the world at the expense of intra-WAMZ trade has resulted in an increase in the share of global shocks in business cycles in the WAMZ.

Ex Post OCA

Proceeding from the *ex ante* analyses, the study largely analyzed how the WAEMU has fared by looking at demand and supply shocks, prices and intra-regional trade. This was done to check whether the OCA endogeneity theory holds in the WAEMU, based on which we could hypothesize the future of the WAMZ. It was found that prices in the WAEMU have converged with time and this is attributable to the pursuit of a common monetary policy. Further evidence to this was the case of Guinea Bissau, which was not a member of the monetary union until 1997. The evidence shows that the country's prices started converging with the rest of the WAEMU from the year 2000 after it had fully integrated into the WAEMU. There is therefore evidence to show that price endogeneity is achievable.

The study also found that demand shocks in the WAEMU are symmetric. This is in consonance with the fact that prices have converged within the Zone since demand shocks are based on monetary policy which also influence prices. The same cannot be said for supply shocks though. Supply shocks continue to remain asymmetric despite more than sixty years of sharing a common monetary policy and a single currency. *Ex post* demand shocks synchronicity is consequent to the strict adherence to stringent common monetary policies, however, only a deliberate tinkering of the production and export structures can result in supply shocks synchronicity.

Finally, the study sought to establish trade endogeneity by employing the gravity model to test whether the WAEMU has gained an intra-regional trade enhancement advantage over the WAMZ because of its use of a single currency. Apart from confirming the expected signs of the coefficients of the other regressors – border, area, distance, GDP and colonizer – the model confirmed that having a single currency had given the WAEMU an advantage over the WAMZ in terms of intra-regional trade. However, it concludes that the single currency effect might not hold within the WAMZ because of the fact that it is geographically disjointed. The study also found that the devaluation of the CFA franc in 1994 has done a great disservice to intra-WAEMU trade, and the commencement of the WAMZ, through the establishment of the WAMI, has not fostered intra-WAMZ trade.

Thus, on the whole, both the *ex ante* and *ex post* analyses give room for pessimism regarding the feasibility of a monetary union in the WAMZ. While the former casts a doubt on the feasibility of a monetary union in the WAMZ, owing to the fact that the countries experience idiosyncratic shocks and have very little regional characteristics, the latter, using the WAEMU as a reference point, confirms that trade enhancement, price convergence and demand shocks synchronicity can be achieved *ex post*. However, the study concludes that while price convergence and demand shocks synchronicity can be replicated in the WAMZ, trade endogeneity and supply shocks synchronicity might not be achieved easily. The study attributes its pessimism of the WAMZ's ability to achieve trade endogeneity to the fact that it is geographically disjointed, unlike the WAEMU. It must also be recalled that even though it has this trade advantage over the WAMZ, intra-regional trade in the WAEMU is still a paltry 12 percent because not much has been done

by way of improving trade. Supply shocks, on the other hand, may not synchronize after the commencement of a WAMZ monetary union because the economies are still engaged in the same production and export activities which have led to shocks asymmetry.

Going forward, the discovery of oil in Ghana, and the potential discovery of the same commodity in the rest of the countries, while creating a possible trade divergence, has the tendency of causing the countries to experience similar terms of trade shocks and supply shocks. In this regard, the prospects of a monetary union in the WAMZ looks bright as long as they continue to pursue monetary and fiscal discipline and diversify their economies. It is in this light that the study suggests a gradual move towards a monetary union by recommending an alternative exchange rate arrangement, as summarized below.

Alternative Exchange Rate Arrangements

A variant of the BE model was used to assess the viability of an exchange rate mechanism based on a basket currency consisting of regional currencies only. The correlation results of the real exchange rate shocks revealed that it would be unadvisable to institute such an exchange rate arrangement since the countries experience different real exchange rate shocks. The study proceeds to assess an alternative exchange rate arrangement based on an external anchor, with either the US dollar or the euro as the proposed anchor currency. The results indicated that while the US economy influences WAMZ prices more than the Euro Area's economy does, the Euro Area's supply shocks have a greater impact on WAMZ business cycles. Based on this, it was suggested that an exchange rate mechanism with the euro at the centre of the bands should be adopted to

ensure monetary and fiscal discipline and stability. This form of intermediate regime could lead the countries to stabilization, since their operation of flexible regimes has very little to show in terms of stability. However, it is suggested that this regime should not take less than five years or more than ten years if the countries are committed to it. Monetary unification will be consequent to this being achieved.

The inclusion of Liberia solidified the earlier assertion of choosing the euro as an anchor currency over the dollar. Its inclusion took the number of countries whose business cycles are influenced more by European supply shocks rather than US supply shocks to four. In effect, between the two currencies, the study suggests that the euro should be the adopted currency.

While this alternative arrangement does not remove transaction costs completely, when combined with currency convertibility, this regime will help reduce transaction costs and ensure exchange rate and general macroeconomic stability at the same time. It also gives countries partial monetary policy autonomy.

7.2 Recommendations

The study largely advocates the postponement of the monetary union until such a time that the countries' shocks begin to co-move. However, this will not happen in a vacuum, as there are certain processes and policy considerations that would have to be brought to bear on the conduct of both monetary and fiscal policy across the Zone in order to realize this goal. Some of these policy considerations are enumerated in the succeeding paragraphs.

7.2.1 Intra-regional Trade Deepening

As indicated earlier on, intra-regional trade tends to facilitate shocks synchronicity. The study showed that intra-WAMZ trade is very low. With trade hovering around 2.3 percent, a full-fledged monetary union would not reap enough benefits as regards transaction costs savings. The study also showed that even the WAEMU, after sixty years of existence, has failed to raise intra-regional trade above 12 percent, even though the gravity model shows that it has done much better than the WAMZ because of its use of a single currency. This goes to attest that monetary unions do not necessarily result in intra-regional trade, even though they provide an enabling environment for it to thrive. Trade increment results from a number of factors, inclusive of the production of goods that are in demand in the region, provision of tariff incentives, and provision of infrastructure, among others. All of these measures, in addition to the reduction in transaction costs which is consequent to monetary unions, would ensure that intra-regional trade deepens. Hence, the WAMZ will have to make a number of radical changes in order to boost trade within the region *ex ante*. Given the little intra-regional trade opportunities and low prices of traded commodities (mainly foodstuffs), WAMZ intra-regional trade will continue to be low, unless there is a significant change in taste and industrial structures to meet the desires of the region.

Common External Tariffs

The ECOWAS has a proposed CET, as outlined in chapter 3. The WAMZ would have to follow the WAEMU in activating these tariffs in order to deepen trade in the Zone. With the activation of these tariffs, goods produced in the Zone will move tariff-

free across borders. This will promote trade within the Zone. Furthermore, producers of certain imported goods might consider producing them within the WAMZ in order to check price hikes resulting from the CET. This could reduce transportation costs and subsequently prices.

The ECOWAS Single Economic Space Agreement

The gravity model results indicated that intra-WAMZ trade has suffered, owing in part to the geographical locations of the countries involved. That is to say, countries tend to trade more with their next door neighbours. Since the WAMZ is geographically disjointed, it would be prudent to activate the open border trade mechanism with the WAEMU, as enshrined in the ECOWAS protocols, to ease trade across borders. This will facilitate the transportation of goods from one WAMZ country through the WAEMU into other WAMZ countries.

Customs Check Points

The study acknowledges the complexities involved in rapidly abolishing customs check points, due to the lack of adequate logistics to check the importation of contraband goods and to monitor cross-border crimes. In view of this, it recommends that customs officials are properly incentivized and monitored to reduce corruption at the borders, to the barest minimum in order to allay the fears of traders and to keep prices low within the Zone. Consequently, check points should be gradually phased out so as to reduce the amount of time it takes to commute between countries. However, this must be done only

after the countries have enhanced security cooperation to make it easier to track criminals and smuggled goods.

Infrastructural Development

One of the hindrances to inter-WAMZ trade has been the time it takes to commute from one country to another. Aside from the numerous check points that exist on inter-country routes, the bad nature of inter-connecting roads has been blamed for this. Some of these roads are in a deplorable state. In addition to this, there are only a few direct flights connecting WAMZ countries. Though the days where one had to travel to Europe before being able to connect to a fellow African country are over, a lot remains to be done to ease the difficulties of air travel within the WAMZ. This increases the cost of trade and eventually prices. Some traders are thus better off trading with countries other than those in the WAMZ.

Currency Convertibility

The WACH was meant to facilitate trade within the ECOWAS by encouraging the use of a regional mechanism, rather than hard currencies, to pay for goods and services within the sub-region. There is an easier route which could eliminate the backlog of debts and bureaucracies that was associated with this system. The countries need to make their currencies convertible. Once this is done, trade could be enhanced since transaction costs associated with currency exchange would have been eliminated.

7.2.2 Economic Diversification

Economic diversification in the WAMZ could ensure that idiosyncratic shocks are reduced to minimal levels. The countries must pay particular attention to the non-traditional export sector in order to facilitate the spread of shocks (both positive and negative) across sectors. For example, why should Nigeria import salt from Brazil when Ghana has huge deposits of the same commodity? This is because Ghana has not developed its salt sector to be able to produce enough to meet the needs of Nigerians. When the countries harness the potential of other economic sectors, not only can they enhance intra-WAMZ trade, but also facilitate shocks dispersion through the cancelling out of positive and negative shocks in the various sectors of the economy.

Furthermore, there must be a deliberate attempt to change the structures of some economies for the purpose of diversification. For example, the countries could channel receipts from natural resources into manufacturing or certain agricultural sub-sectors in order to improve them. In addition, intra-industry links should be encouraged within the Zone, based on the availability of resources, for example. This could help harmonize shocks.

7.2.3 Institutions

Without enforcement, protocols are useless. The ECOWAS protocols are a typical example. The WAMI has no authority to punish recalcitrant members which fail consistently to heed the dictates of set targets. The study has shown that strong institutions make a difference, as evidenced by post-1994 WAEMU prices. It showed that prices, including those of Guinea-Bissau after 1997, began to synchronize after the

WAEMU central bank had started enforcing the monetary rules. The WAMZ needs strong institutions to ensure pre-monetary union trade deepening, monetary policy adherence, prudent expenditure decisions and general macroeconomic stabilization. The lack of strong institutions underpins all the problems in the WAMZ. If these could be addressed once and for all, the WAMZ could be on its way to shocks synchronicity in no time.

7.2.4 A Euro-based Exchange Rate Mechanism

As indicated earlier, the WAMZ should institute an ERM with the euro as the central rate as a step to achieving and consolidating stability before proceeding to establish the proposed monetary union. This mechanism, which should last between five and not more than ten years, should be allowed to move within a ± 15 percent band, after which it should be narrowed based on their performance.

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APPENDICES

Appendix 1

A List of Natural Resources

Resource	The Gambia	Ghana	Guinea	Nigeria	Sierra Leone
Fish	X	X	X		
Gold		X	X		X
Silver		X			
Diamonds		X	X		X
Petroleum	X	X		X	
Timber		X			
Hydropower		X	X		
Bauxite		X	X		X
Salt		X	X		
Uranium			X		
Iron ore			X	X	X
Titanium	X				X
Tin	X			X	
Manganese		X			
Natural gas				X	
Coal				X	
Zinc				X	
Rubber		X			
Limestone		X		X	
Lead				X	

Source: Central Intelligence Agency, World Factbook (2009)

Appendix 2

Structure of Services Exports in the WAMZ

Country	Commercial Service Exports		Transport		Travel		Insurance and Financial Services		Computer, info., comm., and other commercial services	
	Smillions		% of commercial services		% of commercial services		% of commercial services		% of commercial services	
	1990	1995	1990	1995	1990	1995	1990	1995	1990	1995
Exports										
Gambia, The	53	38	8.8	21.7	87.9	73.4	0.1	0.3	3.3	4.7
Ghana	79	139	49.2	58.7	5.6	7.9	2.7	3.0	42.6	30.3
Guinea	91	17	14.2	75.3	32.6	5.1	0.1	1.4	53.2	18.2
Nigeria	965	608	3.9	16.4	2.5	2.8	0.3	0.6	93.3	80.2
Sierra Leone	45	71	9.7	13.7	76.2	80.5	..	0.3	14.1	5.6
Country	Commercial Service Exports		Transport		Travel		Insurance and Financial Services		Computer, info., comm., and other commercial services	
	Smillions		% of total		% of total		% of total		% of total	
	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006
Exports										
Gambia, The	80	92	19.4	17.5	70.8	71.9	0.5	0.4	9.4	10.3
Ghana	1,043	1,301	14.0	15.8	76.3	66.2	0.8	0.8	8.9	17.3
Guinea	31	31	21.8	21.8	0.4	0.4	77.8	77.8
Nigeria	4,164	4,164	17.5	17.5	0.4	0.4	0.2	0.2	81.8	81.8
Sierra Leone	78	40	14.9	34.2	82.1	57.9	3.0	6.1	0.1	1.8

Source: World Development Indicators CD-ROM 2008

Appendix 3

Appendix 3A Value of Bilateral Trade within the WAMZ

Between The Gambia and:							
Exports (Millions of US Dollars)							
	2000	2001	2002	2003	2004	2005	2006
Total	45.7	27.3	31.2	18.5	37.9	27.8	36.6
Ghana	0.17	0.18	0.2	0.25	0.33	0.38	0.47
Guinea	0.07	0.02	0.03	0.08	0.24	0.28	0.34
Nigeria	0.49	0.01	0.05	0	0	0	0
Sa Leone	0.03	0.03	0.03	0.04	0.05	0.06	0.08
Imports (Millions of US Dollars)							
	2000	2001	2002	2003	2004	2005	2006
Total	334.4	398.6	412.2	505.7	576.6	638.2	710.9
Ghana	0.83	0.91	0.99	1.26	1.65	1.88	2.33
Guinea	0.14	0	0	0	0.04	0.05	0.06
Nigeria	0.05	0	0	0	0	0	0
Sa Leone	0.28	0.31	0.34	0.43	0.57	0.65	0.8

Between Ghana and:							
Exports (Millions of US Dollars)							
	2000	2001	2002	2003	2004	2005	2006
Total	1485.4	1478.5	1650.5	1986.9	2284.5	2363.9	2840.6
The Gambia	0.75	0.83	0.9	1.14	1.5	1.71	2.12
Guinea	0.67	0.11	0.12	0.36	0.83	0.95	1.18
Nigeria	12.87	10.89	16	20.35	26.47	33.7	41.6
Sa Leone	0.13	0.14	0.15	0.19	0.26	0.29	0.36
Imports (Millions of US Dollars)							
	2000	2001	2002	2003	2004	2005	2006
Total	2871.1	2685.5	3011.4	3848.6	5192.2	5902.6	6787.4
The Gambia	0.18	0.2	0.22	0.28	0.37	0.42	0.52
Guinea	0.03	0.05	0.06	0.01	0.11	0.13	0.16
Nigeria	288.36	298.24	417.42	499.88	661.45	899.77	1131.18
Sa Leone	0	0	0	0	0	0	0

Between Guinea and:							
Exports (Millions of US Dollars)							
	2000	2001	2002	2003	2004	2005	2006
Total	617.4	542.7	828.1	628.7	559.6	1327.9	1350.6
The Gambia	0.12	0	0	0	0.04	0.04	0.05
Ghana	0.02	0.05	0.05	0.01	0.1	0.12	0.15
Nigeria	0.04	0.17	5.17	0.08	0.05	0.06	0.07
Sa Leone	0.75	1.09	1.18	1.62	2.01	2.29	2.83
Imports (Millions of US Dollars)							
	2000	2001	2002	2003	2004	2005	2006
Total	532.8	498.8	876.9	694	1140.5	1872	2250
The Gambia	0.08	0.03	0.03	0.09	0.27	0.3	0.38
Ghana	0.74	0.12	0.13	0.39	0.92	1.05	1.29
Nigeria	1.55	1.22	9.71	1.64	4.01	5.46	6.86
Sa Leone	3.42	0.01	0.01	0.19	0.59	0.67	0.83
Between Nigeria and:							
Exports (Millions of US Dollars)							
	2000	2001	2002	2003	2004	2005	2006
Total	27042	18045	18340	24062	33307	43503	53842
The Gambia	0	0	0	0	0	0	0
Ghana	262	271	379	454	601	818	1028
Guinea	12	0	9	0	4	4	6
Sa Leone	0	0	0	0	0	0	0
Imports (Millions of US Dollars)							
	2000	2001	2002	2003	2004	2005	2006
Total	5824	7928	8733	14852	20472	24484	29368
The Gambia	1	0	0	0	0	0	0
Ghana	14	12	18	22	29	37	46
Guinea	1	11	6	25	0	0	0
Sa Leone	0.02	0.1	0	0.4	0.52	0.67	0.82

Between Sierra Leone and:							
Exports (Millions of US Dollars)							
	2000	2001	2002	2003	2004	2005	2006
Total	126	55.7	105.8	140.6	184	195.9	208.9
The Gambia	0	0	0	0	0	0	0
Ghana	0	0	0	0	0	0	0
Guinea	3.11	0.01	0.01	0.17	0.53	0.61	0.75
Nigeria	0.02	0.1	0	0.4	0.52	0.67	0.82
Imports (Millions of US Dollars)							
	2000	2001	2002	2003	2004	2005	2006
Total	316.2	420.3	495.9	602	523	609.2	560.1
The Gambia	0.03	0.03	0.04	0.04	0.06	0.07	0.08
Ghana	0.14	0.16	0.17	0.21	0.28	0.32	0.4
Guinea	0.82	1.2	1.3	1.78	2.21	2.52	3.12
Nigeria	0	0	0	0	0	0	0

Source: Calculated from the Direction of Trade Statistics Yearbook (2007)

NOTE: 'Total' refers to total exports (imports) by the country to (from) the world.

Appendix 3B Country Shares of Intra-WAMZ Trade

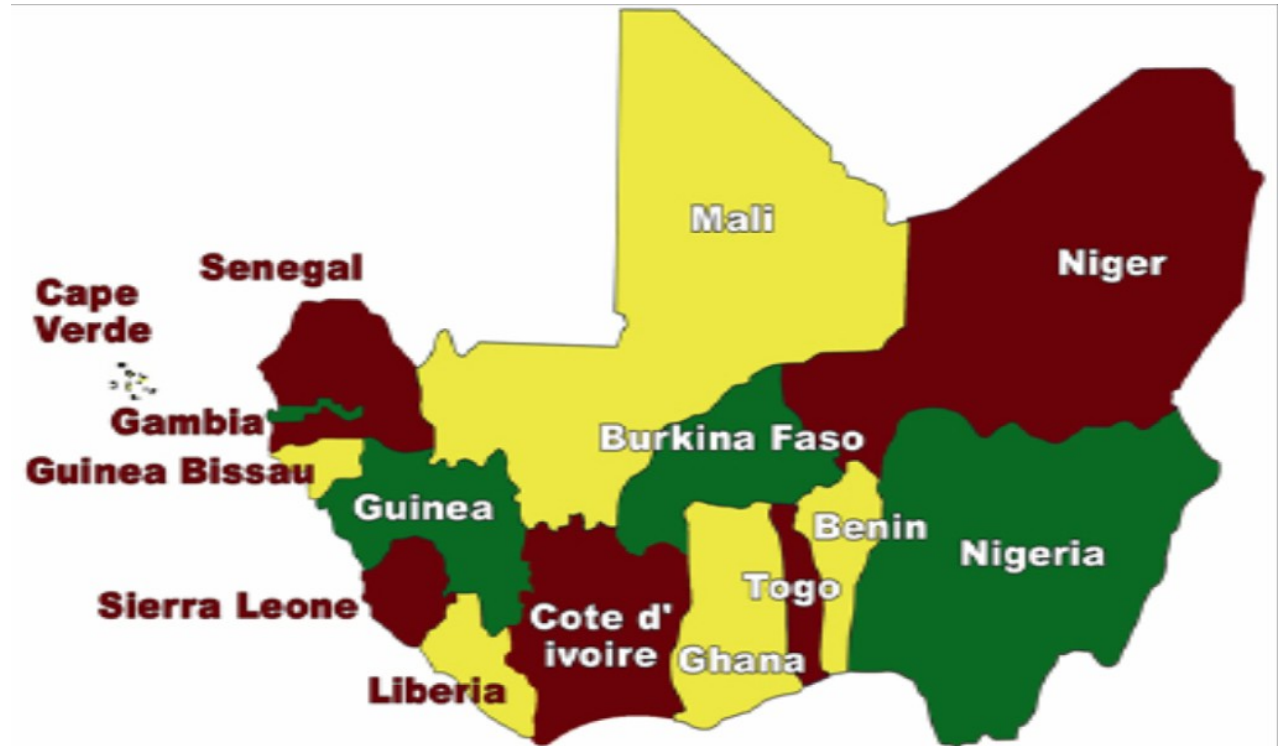
Country Shares of Intra-WAMZ Exports							
	2000	2001	2002	2003	2004	2005	2006
The Gambia	0.26	0.08	0.08	0.08	0.10	0.08	0.08
Ghana	4.92	4.21	4.17	4.60	4.56	4.25	4.17
Guinea	0.32	0.46	1.55	0.36	0.34	0.29	0.29
Nigeria	93.44	95.21	94.20	94.84	94.84	95.23	95.32
Sa Leone	1.07	0.04	0.00	0.12	0.16	0.15	0.14

Country Shares of Intra-WAMZ Imports							
	2000	2001	2002	2003	2004	2005	2006
The Gambia	0.42	0.37	0.29	0.31	0.32	0.27	0.27
Ghana	92.29	91.68	91.92	90.35	94.29	94.67	94.73
Guinea	1.85	0.42	2.17	0.42	0.82	0.79	0.78
Nigeria	5.12	7.10	5.28	8.56	4.20	3.96	3.92
Sa Leone	0.32	0.43	0.33	0.37	0.36	0.31	0.30

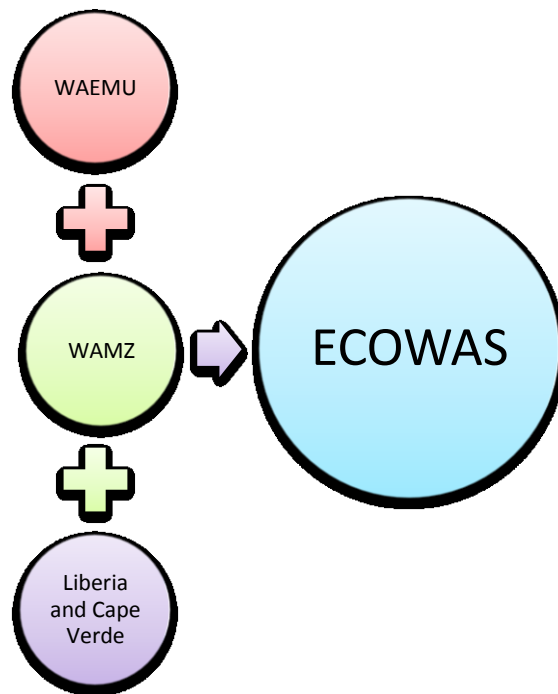
Source: Calculated from the Direction of Trade Statistics Yearbook (2007)

Appendix 4

Appendix 4A Map of ECOWAS

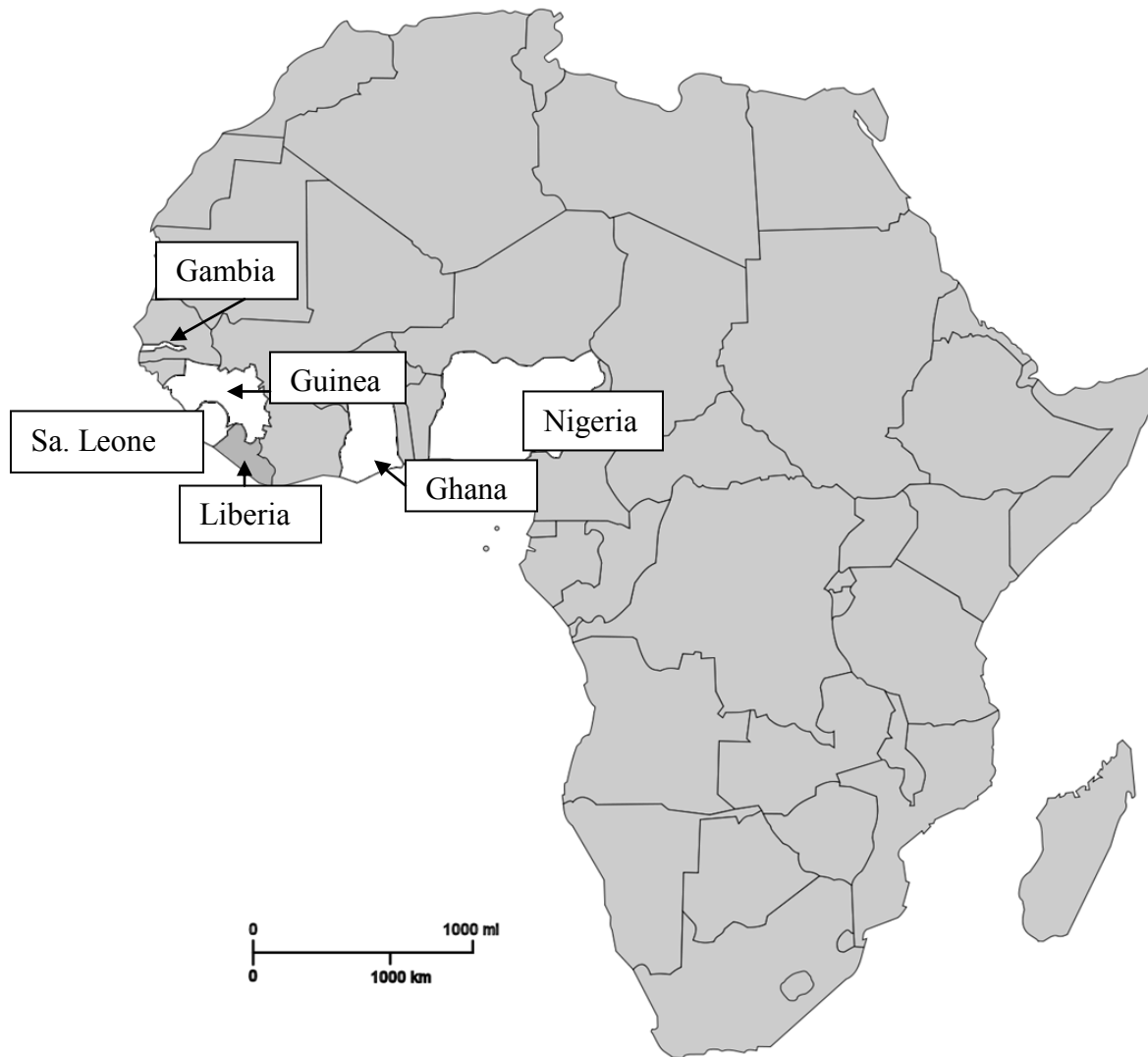


Appendix 4B Components of ECOWAS



NB: With the admittance of Liberia into full WAMZ membership, Cape Verde is the only one that is not attached to either the WAEMU or the WAMZ, even though it has observer status in the WAMZ.

Appendix 4C Map of the WAMZ



Appendix 4D Summary of the WAMZ

I. The Organs of the WAMZ

- i. **The Authority of Heads of State and Government:** It is the supreme body of the Zone, made up of Heads of State and Government of the Zone sitting in Conference. The Authority normally meets twice in a year to decide on matters referred to it by the Convergence Council.
- ii. **The Convergence Council:** It is the policy body of the Zone, composed of four Ministers from each country representing the Ministries of Foreign Affairs, Finance, Trade/Commerce, Regional Integration and Cooperation; the Governors of Central Banks of the five countries and the ECOWAS Secretariat. The Council meets three times in a year.
- iii. **Forum of Finance Ministers:** This is the advisory body created to ensure greater involvement of Finance Ministers in the implementation of the programme of the Zone. The Forum meets twice a year to deliberate on the status of implementation of the WAMZ programme.
- iv. **The Committee of Governors:** The Committee of Governors of Central Banks consists of the Governors of the central banks of the five countries, which acts as the technical supervisory body of the Zone.
- v. **The Technical Committee:** The Technical Committee is the expert body that reviews and makes proposals for the consideration of the Committee of Governors and the Convergence Council. It is made up of representatives of the Convergence Council members, as well as the ECOWAS Secretariat.

Source: WAMI. 2003. *Countdown to the Monetary Union, 2000-2005*. www.wami-imao.org

II. The Institutions of the WAMZ

- i. **The West African Monetary Institute (WAMI):** It is the Institution which was set up to prepare the grounds for the eventual creation of a monetary union.
- ii. **The Stabilization and Cooperation Fund (SCF):** The SCF is a US\$100 million solidarity fund, with an initial called-up capital of US\$50 million, set up to provide temporary balance of payments support to member states. The African Development Bank (AfDB) has been given the responsibility to manage the Fund.
- iii. **The West African Central Bank (WACB):** It is the common central bank, which is expected to commence operations shortly before the issuance of the single currency. Its functions will be to issue the common currency and conduct monetary policy and manage the zonal foreign reserves.
- iv. **The National Central Banks (NCBs):** It is made up of all existing central banks in the Zone, which will constitute branches of the WACB.

Source: WAMI. 2003. *Countdown to the Monetary Union, 2000-2005*. www.wami-ima.org

III. Chronology of Events Leading to the WAMZ

- i. **May 1975 ECOWAS** established with the aim of promoting economic and monetary integration and fostering improved trade relations among its members.
- ii. **1975 WACH** established to simplify intra-regional trade in ECOWAS through WAUA, the benchmark for determining the relative strength of the currencies in the WACH.
- iii. **1978 WABA** formed to serve as an intermediary between the central banks and commercial banks within the WACH mechanism.
- iv. **1987 EMCP** established to transition the sub-region towards monetary unification.
- v. **1995 WAMA** established to replace WACH due to the ineffectiveness of the latter.
- vi. **March 1996 WAMA** commences operations in Freetown, Sierra Leone.
- vii. **Dec. 1999** The Authority of Heads of States and Government of ECOWAS proposes the creation of a parallel monetary union to the WAEMU to fast-track the realization of the West African monetary union.
- viii. **May 2000** Committee of ECOWAS Central Bank Governors consider the modalities of merging WAEMU and the proposed new monetary union (the WAMZ) and settle on a three-phase approach.
- ix. **Jan. 2001 WAMI** established in Accra, Ghana, to prepare the grounds for the establishment of a common central bank for the WAMZ. This effectively marks the beginning of the WAMZ.

IV. Landmark Decisions

On December 20, 2001, the Heads of State and Government of The Gambia, Ghana, Guinea, Nigeria and Sierra Leone adopted and signed the following decisions in Dakar, Senegal.

- i. To establish an Exchange Rate Mechanism (ERM) by April 1, 2002, the modalities of which would be worked out between the WAMI and the NCBs. The ERM was to have the US dollar as the anchor currency within a margin of ± 15 percent for the first six months of operation, after which a review might be considered.
- ii. Development of National Payments Systems and Efficient Cross-Border Payment Arrangement in the WAMZ.
- iii. Operationalization of the Stabilization and Cooperation Fund, the initial called-up capital (US\$50 million) of which was to be paid by members by the end of September 2002.
- iv. Establishment of National Sensitization Committees in member states in 2002 to help bring the public up to date on issues bordering on the new currency. Ratification of the WAMZ Agreement and WACB Statutes by the end of the third quarter of 2002.
- v. The contribution of the US\$100 million capital of the WACB by member countries by October 31, 2002.
- vi. Adoption of the name ECO as the name of the common currency.

Appendix 5

Appendix 5A Nominal Exchange Rate Depreciation in the WAMZ

	Gambia	Ghana	Guinea	Nigeria	Sa Leone
1990-2000	4.93	33.45	10.59	42.34	43.84
1995-2000	5.01	36.61	10.48	55.26	24.65
2001-2006	17.05	26.91	28.37	5.78	8.83

Source: Calculated from the World Development Indicators CD-ROM (2008)

Appendix 5B WAMZ Money Supply Growth and Real Exchange Rate Growth (Levels)

	Growth of Money Supply		Real Exchange Rate	
	Mean	Standard Deviation	Mean	Standard Deviation
Gambia	0.06	0.06	-1.13	0.16
Ghana	0.12	0.4	-5.89	0.31
Guinea	0.04	0.23	0.92	0.31
Nigeria	0.08	0.07	-1.44	0.32
Sa Leone	0.1	0.07	0.07	0.13

Source: Calculated from the World Development Indicators CD-ROM (2008)

Appendix 5C Correlations of the Growth of Money Supply and Real Exchange Rate

Nominal Money Supply Growth						Real Exchange Rate (Levels)				
	Ga	Gh	Gu	Ng	SL	Ga	Gh	Gu	Ng	SL
Gambia	1					1				
Ghana	-0.04	1				0.24	1			
Guinea	0.22	0.03	1			0.29***	0.91*	1		
Nigeria	-0.08	0.05	0.15	1		0.26	0.12	0.12	1	
Sa Leone	0.29*	0.09	0.13	0	1	0.35**	0.38**	0.39**	0.25	1

Source: Author's Calculations Based on WDI

*Significant at the 0.01 level **Significant at the 0.05 level ***Significant at 10 percent level

Appendix 6

Descriptive Statistics and Correlation of WAMZ Terms of Trade (at Levels)

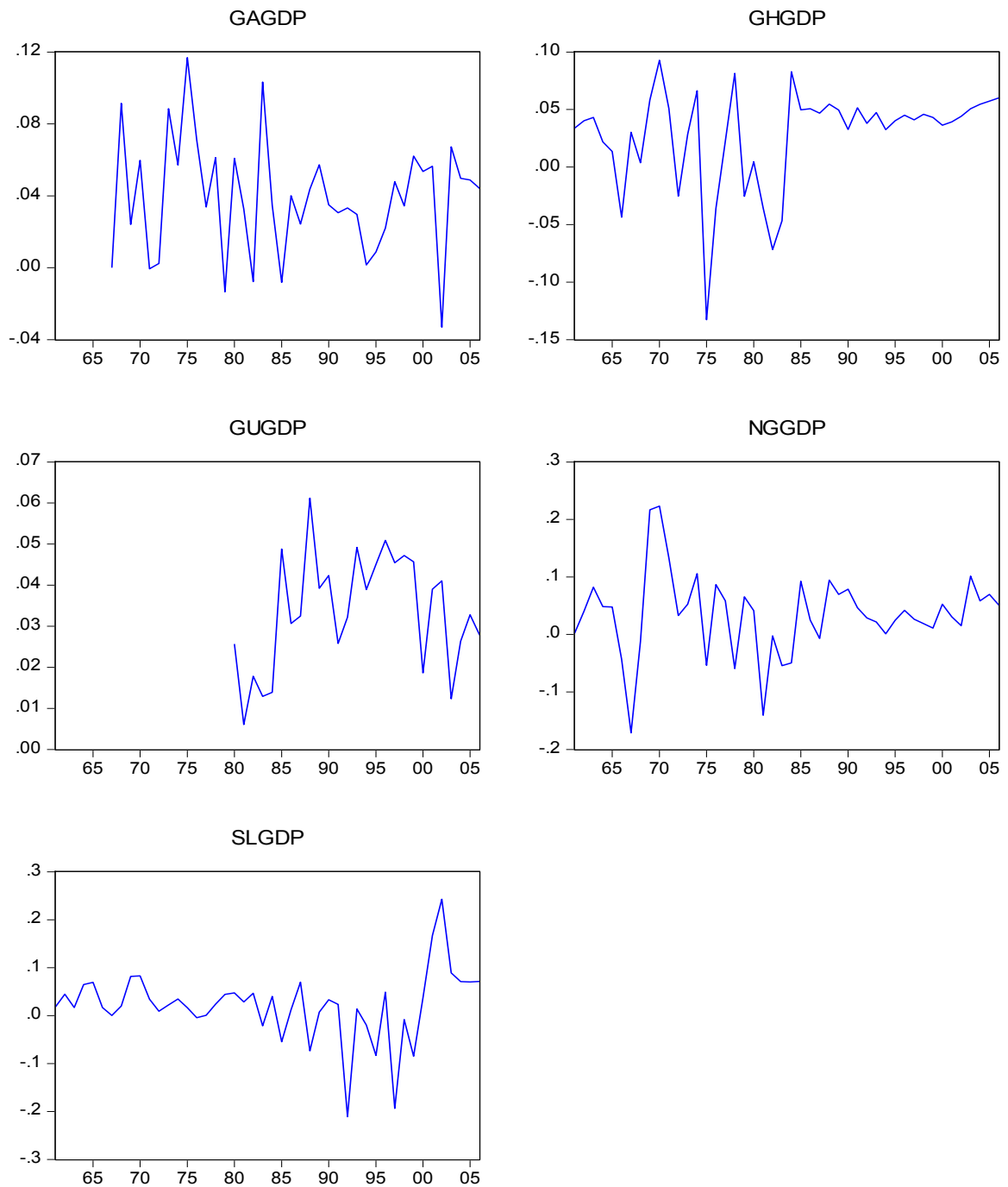
Descriptive Statics of TOT			Correlations of TOT			
	Mean	Std. Dev.	Gambia	Ghana	Guinea	Nigeria
Gambia	1.98	0.03	1			
Ghana	2.07	0.07	-0.26	1		
Guinea	2.03	0.1	-0.70**	0.45*	1	
Nigeria	1.93	0.16	-0.69**	0.51*	0.71**	1

Source: Calculated from the World Development Indicators CD-ROM (2008)

*Correlation is significant at the 0.05 level (2-tailed) **Correlation is significant at the 0.01 level (2-tailed)

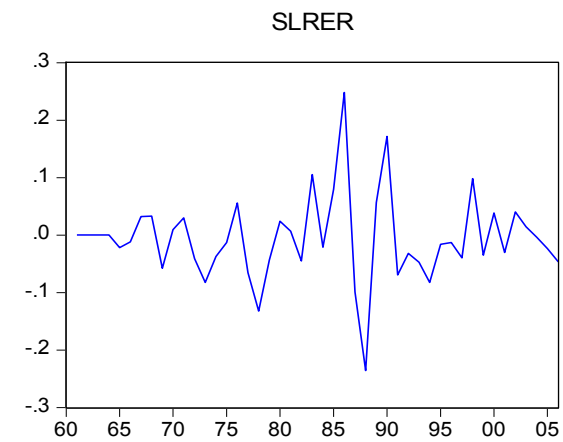
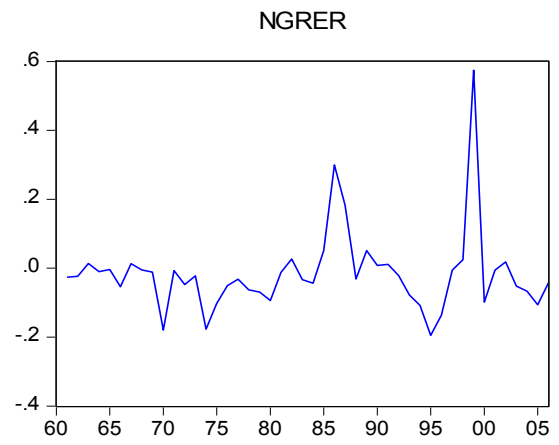
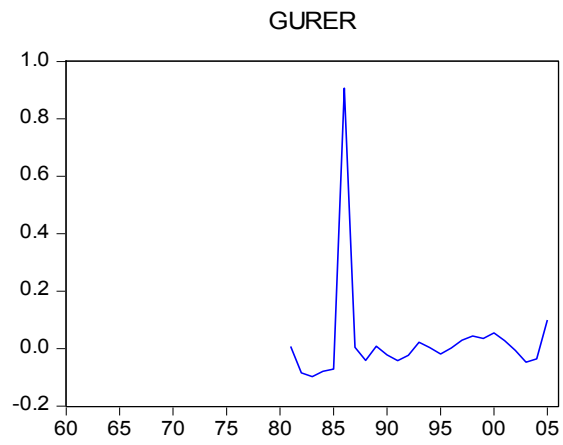
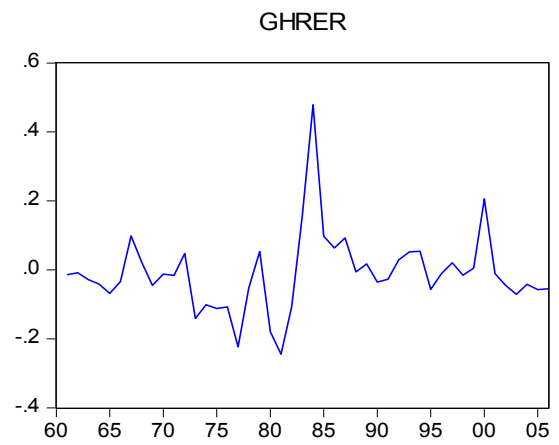
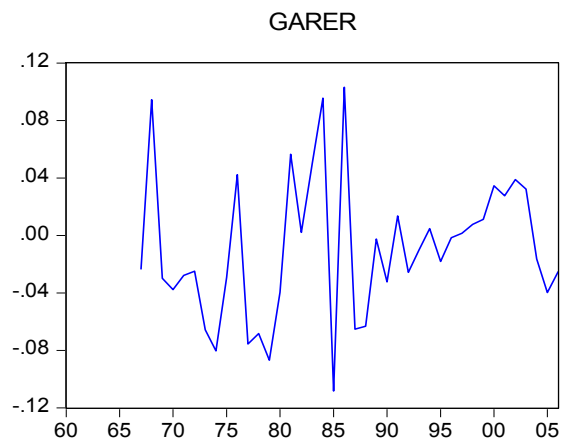
Appendix 7

Appendix 7A Graph of Stationarity Tests on the Natural Log of GDP



From the left top corner, we have The Gambia, Ghana, Guinea, Nigeria and Sierra Leone.

Appendix 7B Graph of Stationarity Tests on the Natural Log of Real Exchange Rates

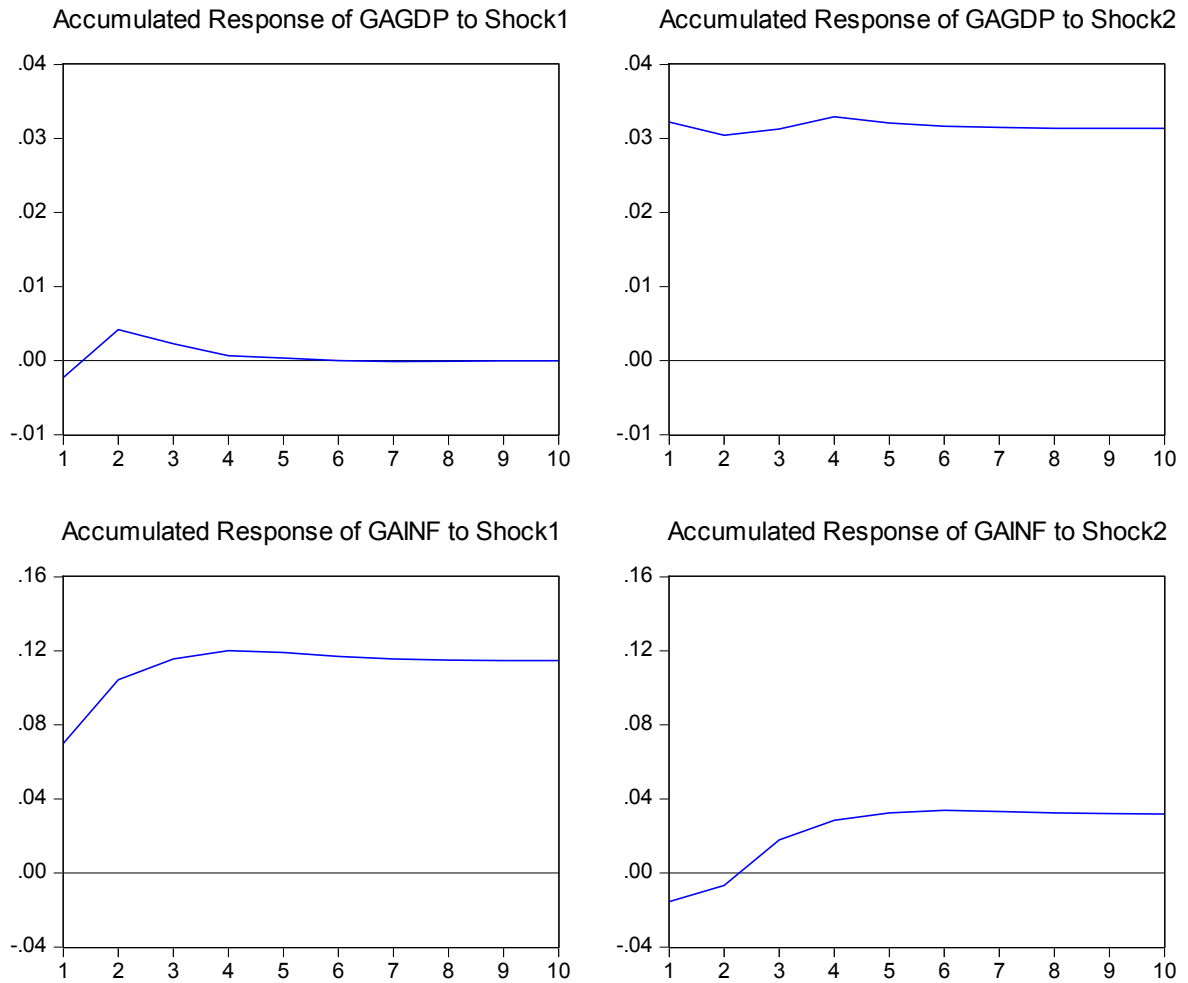


Appendix 8

Accumulated Responses from various Models

The Gambia

Accumulated Response to Structural One S.D. Innovations

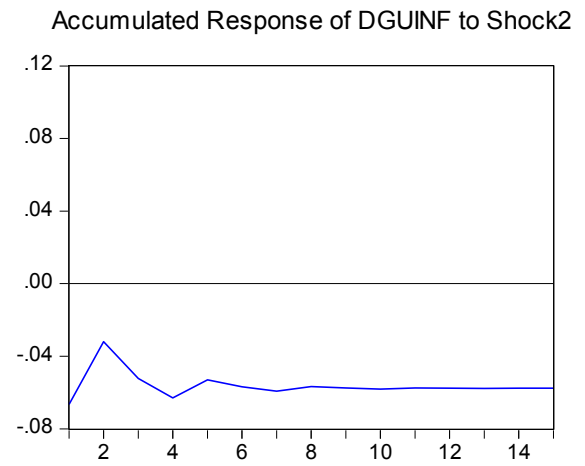
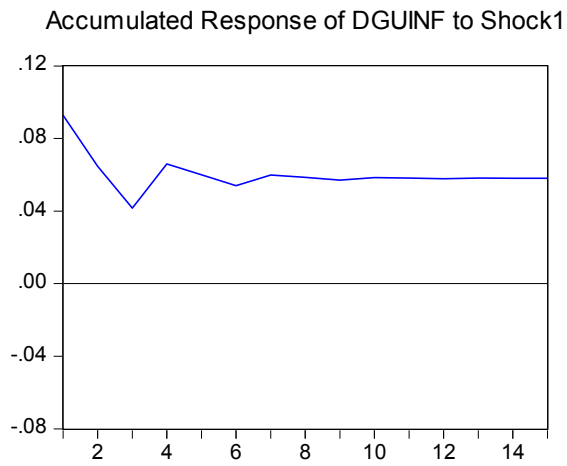
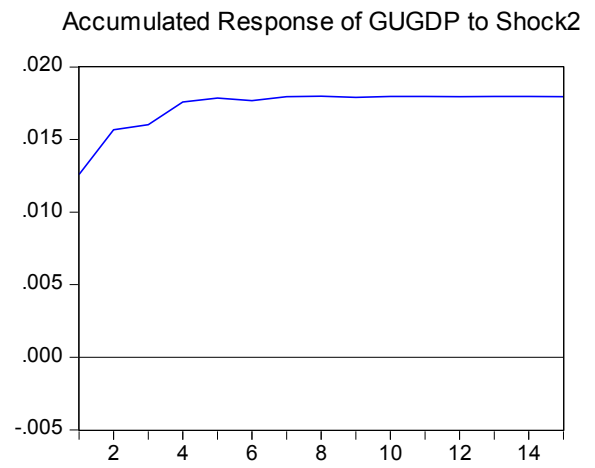
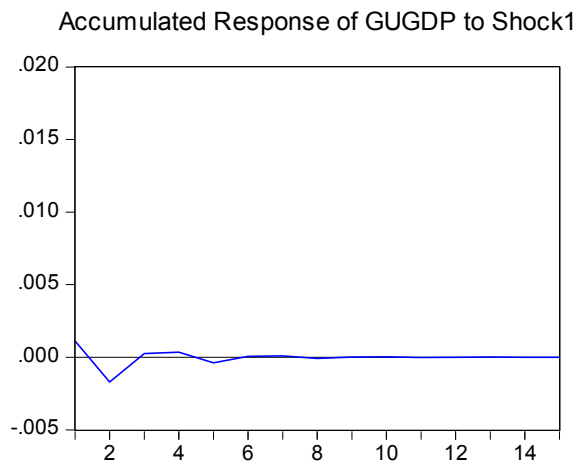


GAGDP = The Gambia's GDP

GAINF = The Gambia's inflation

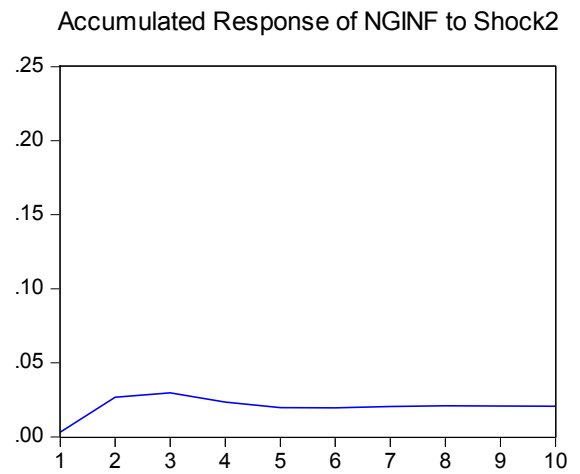
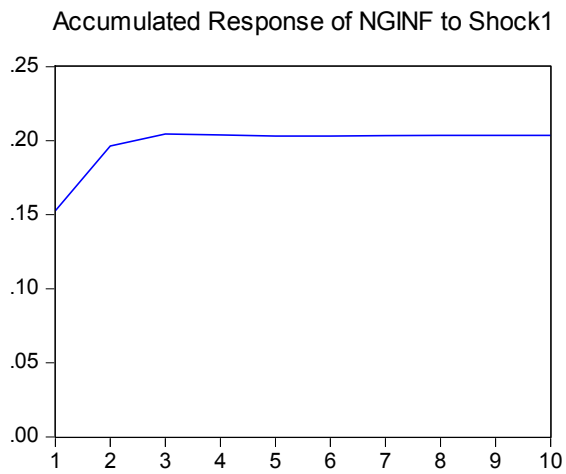
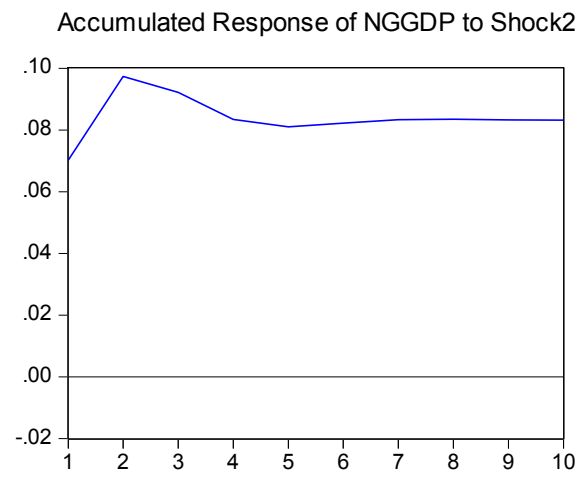
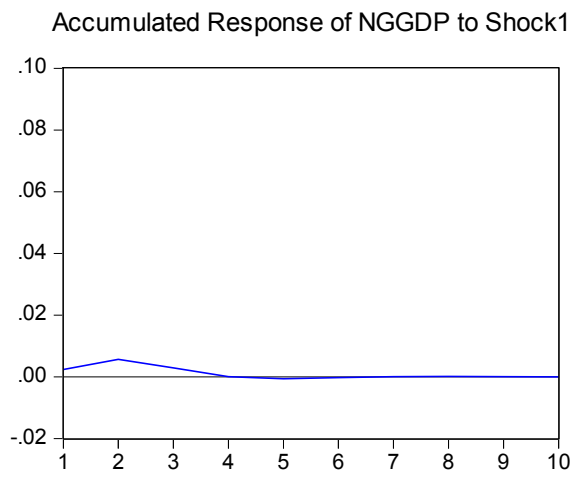
Guinea

Accumulated Response to Structural One S.D. Innovations



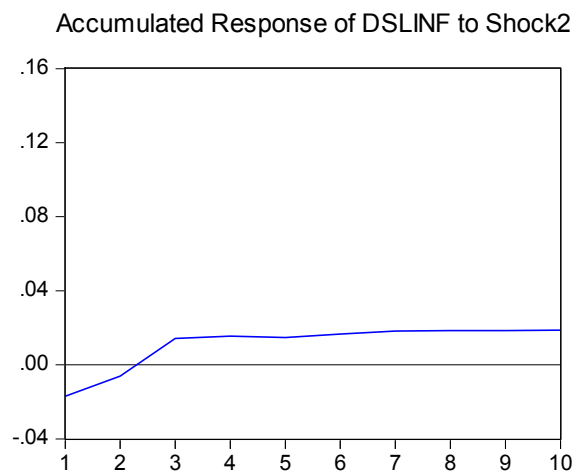
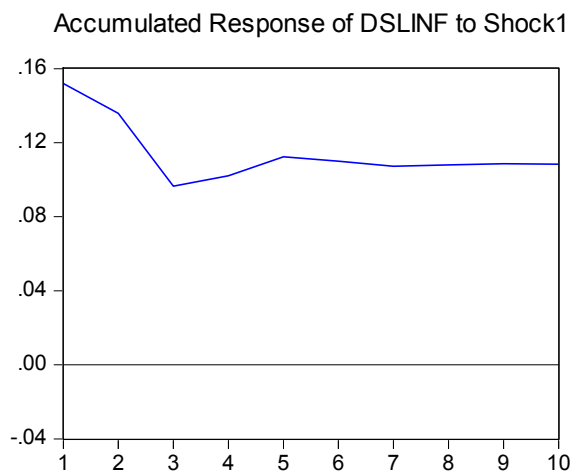
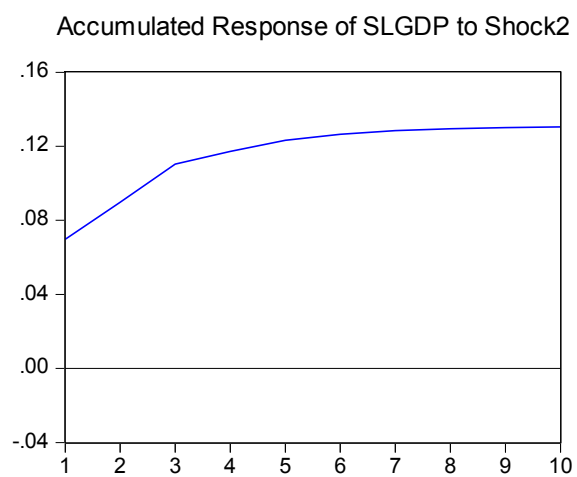
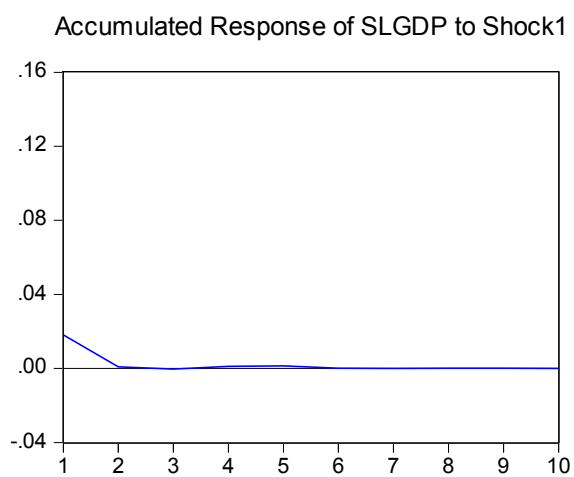
Nigeria

Accumulated Response to Structural One S.D. Innovations



Sierra Leone

Accumulated Response to Structural One S.D. Innovations



Appendix 9

Correlation of Demand and Supply Shocks in Sub-Periods

Pre-SAP (1960-1987):

	Correlation of Supply Shocks					Correlation of Demand Shocks				
	Ga	Gh	Gu	Ng	SL	Ga	Gh	Gu	Ng	SL
Gambia	1					1				
Ghana	0.22	1				-0.26	1			
Guinea	-0.73	-0.52	1			0.66	0.45	1		
Nigeria	-0.86	-0.05	0.86	1		-0.83	0.25	0.74	1	
Sa Leone	0.74	-0.34	-0.60	-0.92**	1	-0.62	0.31	0.61	0.95**	1

*Significant at 5 percent level **Significant at 10 percent level

Post-SAP (1988-2006):

	Correlation of Supply Shocks					Correlation of Demand Shocks				
	Ga	Gh	Gu	Ng	SL	Ga	Gh	Gu	Ng	SL
Gambia	1					1				
Ghana	0.29	1				0.16	1			
Guinea	-0.12	-0.02	1			-0.32	-0.40**	1		
Nigeria	0.21	0.36	-0.30	1		0.02	0.13	-0.21	1	
Sa Leone	-0.27	-0.18	0.10	0.01	1	0.05	-0.22	0.19	-0.21	1

**Significant at 10 percent level

1970-1979:

	Correlation of Supply Shocks					Correlation of Demand Shocks				
	Ga	Gh	Gu	Ng	SL	Ga	Gh	Gu	Ng	SL
Gambia	1					1				
Ghana	-0.18	1				-0.07	1			
Guinea	NA	NA	NA			NA	NA	NA		
Nigeria	-0.41	0.54	NA	1		0.40	-0.13	NA	1	
Sa Leone	-0.04	0.39	NA	0.23	1	-0.04	0.62**	NA	-0.23	1

**Significant at 10 percent level

1980-1989:

	Correlation of Supply Shocks					Correlation of Demand Shocks				
	Ga	Gh	Gu	Ng	SL	Ga	Gh	Gu	Ng	SL
Gambia	1					1				
Ghana	0.01	1				-0.31	1			
Guinea	-0.24	-0.52	1			0.55	0.41	1		
Nigeria	-0.16	-0.11	0.87*	1		-0.66	0.23	-0.78**	1	
Sa Leone	0.24	-0.15	-0.46	-0.59	1	0.23	-0.03	0.25	0.39	1

*Significant at 5 percent level

1990-1999:

	Correlation of Supply Shocks					Correlation of Demand Shocks				
	Ga	Gh	Gu	Ng	SL	Ga	Gh	Gu	Ng	SL
Gambia	1					1				
Ghana	0.56**	1				0.16	1			
Guinea	0.01	-0.03	1			0.24	-0.46	1		
Nigeria	-0.10	0.03	-0.15	1		0.31	0.16	-0.10	1	
Sa Leone	-0.16	-0.15	0.36	0.22	1	-0.40	-0.22	0.40	-0.39	1

**Significant at 10 percent level

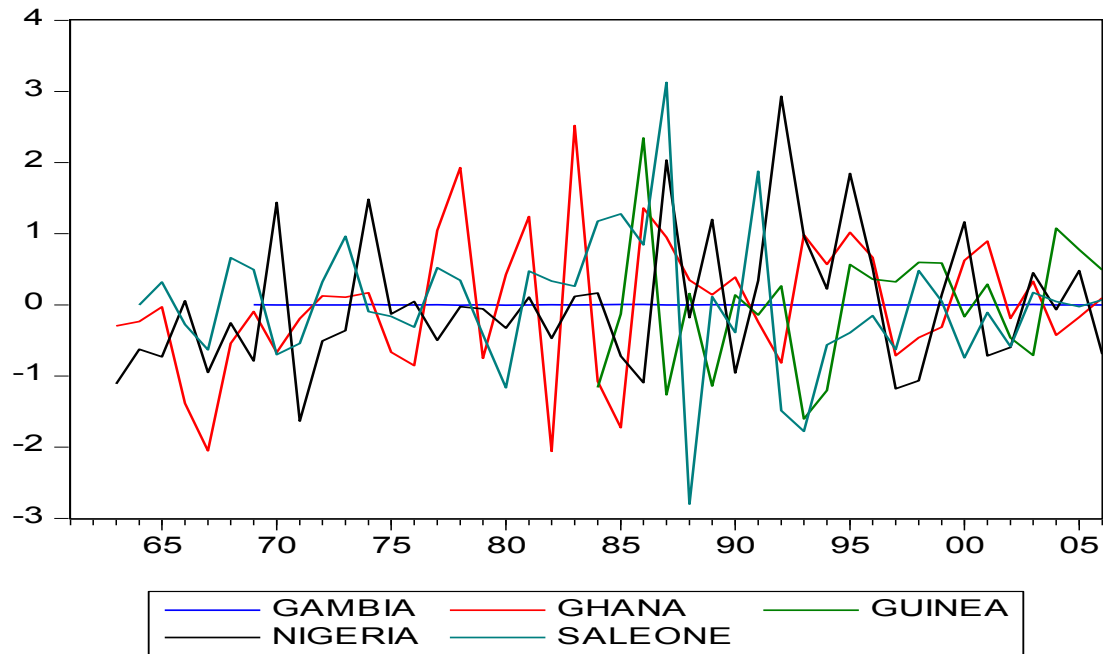
Post-WAMZ (2001-2006)

	Correlation of Supply Shocks					Correlation of Demand Shocks				
	Ga	Gh	Gu	Ng	SL	Ga	Gh	Gu	Ng	SL
Gambia	1					1				
Ghana	0.28	1				0.49	1			
Guinea	-0.16	-0.40	1			-0.73**	-0.34	1		
Nigeria	0.25	0.57	-0.72	1		0.14	-0.30	-0.00	1	
Sa Leone	-0.58	-0.71	0.81*	-0.64	1	0.18	0.16	-0.31	0.48	1

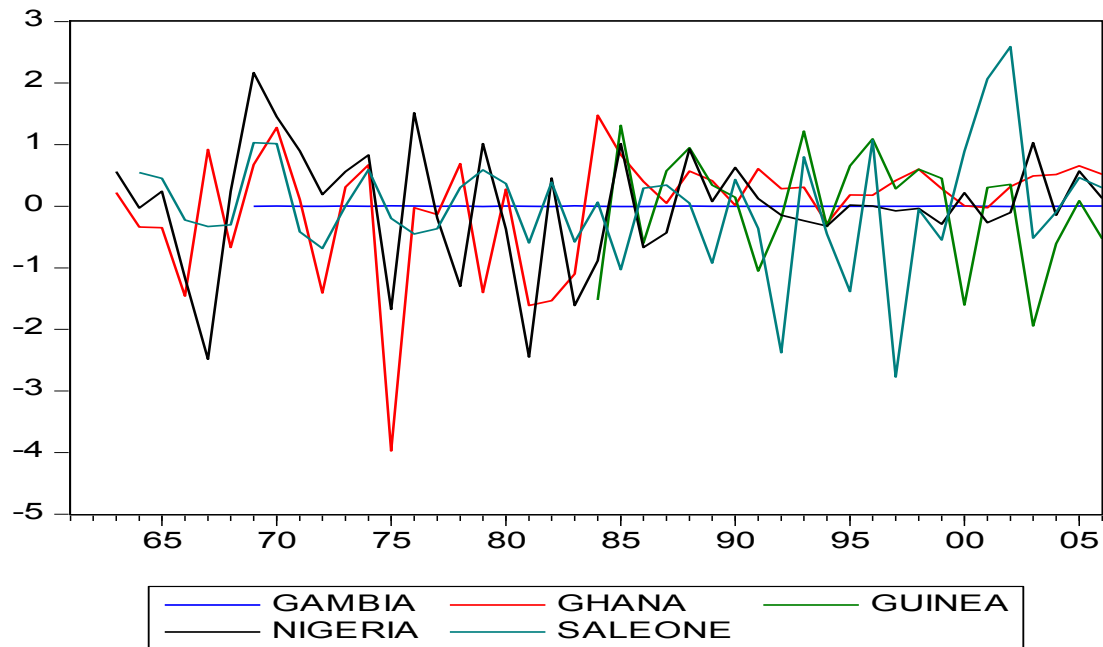
*Significant at 5 percent level **Significant at 10 percent level

Appendix 10

Demand Shocks Representation



Supply Shocks Representation



Appendix 11

Hausman specification test

log Trade	Fixed effects	Random effects	Difference
loggdp	1.831506	1.834659	-0.00315
cfa	0.302658	0.446113	-0.14346
cfa94	-0.40389	-0.42571	0.021822
wami	-0.5752	-0.58311	0.007912

Test: Ho: difference in coefficients not systematic

$$\begin{aligned}\chi^2(4) &= (b-B)'[S^{-1}](b-B), S = (S_{fe} - S_{re}) \\ &= 18.18 \\ \text{Prob}>\chi^2 &= 0.0011\end{aligned}$$

Results of Gravity Model with GDP per capita

Dependent Variable: Trade		
	Fixed Effects	Random Effects
GDP	2.16 (0.00)	2.13 (0.00)
GDP per capita		-1.58 (0.00)
Distance		-1.22 (0.00)
Area		-0.69 (0.00)
Border		0.6 (0.04)
Colonizer		1.12 (0.00)
CFA	0.22 (0.08)	0.41 (0.00)
CFA94	-0.55 (0.00)	-0.55 (0.00)
WAMI	-0.56 (0.00)	-0.6 (0.00)
Constant	-25.73 (0.00)	-18.33 (0.00)
R-Squared	0.81	0.21

Appendix 12

This Appendix reports all the results in the study, inclusive of Liberia.

Appendix 12A Variance Decomposition Test Results

Horizon	Percentage of fluctuations in real output due to:				Percentage of fluctuations in prices due to:			
	Supply Shock		Demand Shock		Supply Shock		Demand Shock	
	1	10	1	10	1	10	1	10
Gambia	99.51	95.17	0.49	4.83	4.66	14.42	95.33	85.58
Ghana	97.58	95.06	2.42	4.94	9.08	34.88	90.92	65.12
Guinea	99.21	92.49	0.79	7.51	33.92	37.06	66.08	62.94
Liberia	99.67	99.50	0.33	0.50	0.45	33.93	99.55	66.07
Nigeria	99.89	99.44	0.11	0.56	0.04	2.43	99.96	97.57
Sa Leone	93.68	90.16	6.32	9.84	1.23	3.20	98.77	96.80

Appendix 12B Correlation of Demand/Transitory Shocks (including Liberia)

Country	With Guinea						Without Guinea				
	Ga	Gh	Gu	Li	Ng	SL	Ga	Gh	Li	Ng	SL
Gambia	1						1				
Ghana	-0.1	1					-0.22	1			
Guinea	0.07	0.04	1								
Liberia	0.16	0.17	-0.26	1			0.12	0.11	1		
Nigeria	-0.22	0.17	-0.37*	0.15	1		-0.06	0.10	0.13	1	
Sa Leone	0.28	-0.12	-0.05	-0.1	-0.03	1	0.25	0.00	-0.09	-0.05	1

Appendix 12C Correlation of Supply/Permanent Shocks including Guinea

Country	Gambia	Ghana	Guinea	Liberia	Nigeria	Sa Leone
The Gambia	1					
Ghana	-0.01	1				
Guinea	-0.23	-0.19	1			
Liberia	-0.02	-0.05	-0.07	1		
Nigeria	0.01	0.04	0.1	0.06	1	
Sa Leone	-0.12	-0.16	0.02	-0.1	-0.1	1

Appendix 12D Correlation of Supply/Permanent Shocks excluding Guinea

Country	Gambia	Ghana	Liberia	Nigeria	Sierra Leone
The Gambia	1				
Ghana	-0.16	1			
Liberia	0.04	-0.1	1		
Nigeria	-0.26	0.41*	0.06	1	
Sierra Leone	-0.12	0.07	-0.07	0.14	1

Appendix 12E Size and Speed of Adjustment to Shocks

Country	Demand Shocks		Supply Shocks	
	Size	Speed	Size	Speed
The Gambia	0.068	0.946	0.031	0.969
Ghana	0.127	0.580	0.065	0.864
Guinea	0.094	1.083	0.018	0.872
Liberia	0.451	0.995	0.482	0.600
Nigeria	0.155	0.992	0.083	1.166
Sierra Leone	0.170	1.255	0.131	0.688
WAMZ Average	0.177	0.975	0.135	0.860
Euro Area Average	0.022	0.417	0.03	0.684

Appendix 12F Variance Decomposition Results

Percentage of fluctuations in real output due to:						
Horizon	Global Shocks		Regional Shocks		Country Shocks	
	1	5	1	5	1	5
Gambia	4.13	15.59	23.26	20.30	72.61	64.11
Ghana	6.58	12.54	28.69	25.46	64.72	62.00
Guinea	2.43	15.99	11.22	14.17	86.35	69.84
Liberia	13.57	14.32	5.16	4.01	81.26	81.67
Nigeria	29.15	28.69	1.92	8.78	68.94	62.53
Sa Leone	1.79	4.24	0.11	0.47	98.10	95.29

Appendix 12G Gravity Model Results

Dependent Variable: Trade		
	Fixed Effects	Random Effects
GDP	1.81 (0.00)	1.83 (0.00)
Distance		-1.40 (0.00)
Area		-0.57 (0.00)
Border		0.56 (0.00)
Language		0.70 (0.00)
CFA	1.20 (0.00)	1.05 (0.00)
CFA94	-0.70 (0.00)	-0.49 (0.00)
WAMI	-0.69 (0.00)	-0.62 (0.00)
Constant	-20.91 (0.00)	-20.83 (0.00)
R-squared	0.60	0.59

NOTE: Numbers in parenthesis are probabilities

Random effect coefficient: $(e^{1.05} - 1) \approx 1.86$ or 186 percent
Fixed effect coefficient: $(e^{1.20} - 1) \approx 2.32$ or 232 percent

Appendix 12H Gravity Model Results including GDP Per Capita

Dependent Variable: Trade		
	Fixed Effects	Random Effects
GDP	1.58 (0.00)	1.71 (0.00)
GDP per capita	0.61 (0.00)	0.34 (0.01)
Distance		-1.43 (0.00)
Area		-0.50 (0.00)
Border		0.54 (0.00)
Language		0.69 (0.00)
CFA	1.11 (0.00)	1.01 (0.00)
CFA94	-0.71 (0.00)	-0.45 (0.00)
WAMI	-0.71 (0.00)	-0.58 (0.00)
Constant	-20.86 (0.00)	-21.13 (0.00)
R-Squared	0.60	0.59

Random effect coefficient: $(e^{1.01} - 1) \approx 1.75$ or 175 percent

Fixed effect coefficient: $(e^{1.11} - 1) \approx 2.03$ or 203 percent

Appendix 12I Correlation of Real Exchange Rate Shocks

	With Guinea						Without Guinea				
	Ga	Gh	Gu	Li	Ng	SL	Ga	Gh	Li	Ng	SL
Gambia	1						1				
Ghana	0.30	1					0.24	1			
Guinea	0.16	-0.10	1								
Liberia	0.25	0.02	-0.00	1			0.26	1E-02	1		
Nigeria	0.10	0.16	0.35	0.12	1		0.26	0.12	0.10	1	
Sa. Leone	0.23	0.32	0.30	0.24	0.20	1	0.35	0.38**	0.22	0.25	1

**significant at the 5 percent level

Appendix 12J Variance Decomposition Test with the US Dollar as a Currency Anchor

		Business cycles due to:					Price changes due to:				
		S.E.	U.S. Supply Shocks	U.S. Demand Shocks	Domestic Supply Shocks	Domestic Demand Shocks	S.E.	U.S. Supply Shocks	U.S. Demand Shocks	Domestic Supply Shocks	Domestic Demand Shocks
Gambia											
	1	0.016	2.31	8.36	88.98	0.34	0.009	0	0.07	3.22	96.71
	5	0.021	3.56	10.74	82.12	3.58	0.012	11.33	3.43	9.36	75.88
	10	0.021	3.62	10.74	81.95	3.69	0.012	11.37	3.65	9.68	75.3
Ghana											
	1	0.017	3.77	32.53	59.35	4.34	0.008	9.29	33.03	2.8	54.88
	5	0.021	18.27	21.71	50.65	9.37	0.012	13.95	47.33	7.33	31.39
	10	0.022	19.44	21.44	49.45	9.67	0.012	12.66	47.18	11.07	29.09
Guinea											
	1	0.01	14.49	1.98	83.25	0.27	0.005	1.26	3.79	77.12	17.83
	5	0.014	15.79	11.82	67.85	4.54	0.006	1.78	12.07	67.99	18.17
	10	0.014	15.83	11.92	67.72	4.54	0.006	1.94	12.26	67.66	18.14
Liberia											
	1	0.07	9.26	0.53	90.15	0.07	0.03	4.08	4.89	0.17	90.85
	5	0.07	9.99	2.51	87.15	0.35	0.04	4.06	5.49	30.63	59.82
	10	0.07	9.82	2.62	87.20	0.36	0.04	4.10	5.56	30.71	59.63
Nigeria											
	1	0.017	0.01	10.55	88.79	0.65	0.009	7.94	1.3	0.28	90.48
	5	0.021	4.88	21.52	70.9	2.71	0.012	12.06	1.18	4.16	82.6
	10	0.022	5.43	21.41	70.4	2.76	0.012	12.6	1.23	4.17	82
Sa Leone											
	1	0.018	16.19	12.59	64.55	6.68	0.009	0	7.99	0	92.01
	5	0.021	12.68	20.19	57.53	9.6	0.012	4.41	7.08	7.04	81.47
	10	0.022	12.75	20.16	57.5	9.59	0.012	5.24	7.31	7.08	80.36

Appendix 12K Variance Decomposition Test with the Euro as a Currency Anchor

		Business cycles due to:					Price changes due to:				
		S.E.	E.U. Supply Shocks	E.U. Demand Shocks	Domestic Supply Shocks	Domestic Demand Shocks	S.E.	E.U. Supply Shocks	E.U. Demand Shocks	Domestic Supply Shocks	Domestic Demand Shocks
Gambia											
	1	0.011	10.08	13.41	66.61	9.89	0.009	1.43	2.75	0.12	95.7
	5	0.014	11.06	13.44	63.64	11.86	0.011	8.94	2.60	0.53	87.93
	10	0.014	11.07	13.43	63.60	11.89	0.011	9.00	2.59	0.54	87.87
Ghana											
	1	0.012	0.29	26.45	73.05	0.20	0.009	1.93	5.36	0.92	91.78
	5	0.014	3.34	22.72	73.66	0.29	0.011	1.67	5.50	27.30	65.53
	10	0.014	3.34	22.72	73.66	0.29	0.011	1.67	5.50	27.33	65.50
Guinea											
	1	0.008	8.59	1.85	83.75	5.81	0.008	13.43	2.27	41.37	42.92
	5	0.012	18.93	1.82	69.37	9.87	0.01	14.52	4.63	43.05	37.8
	10	0.012	18.94	1.83	69.37	9.87	0.01	14.52	4.63	43.05	37.8
Liberia											
	1	0.01	22.56	28.79	48.55	0.10	0.01	7.99	2.61	11.93	77.46
	5	0.01	17.24	38.86	42.34	1.56	0.01	7.57	9.86	34.03	48.53
	10	0.01	17.25	38.76	42.39	1.60	0.02	7.50	10.01	34.32	48.17
Nigeria											
	1	0.012	7.6	10.08	80.19	2.13	0.009	6.29	13.01	13.55	67.14
	5	0.014	11.25	11.02	72.9	4.82	0.011	7.04	12.04	13.69	67.22
	10	0.014	11.26	11.02	72.89	4.83	0.011	7.06	12.04	13.69	67.21
Sa Leone											
	1	0.012	3.25	2.95	87.58	6.22	0.009	1.48	3.77	0.002	94.75
	5	0.014	6.04	14.01	71.23	8.72	0.011	1.69	3.95	2.95	91.41
	10	0.014	6.05	14.01	71.23	8.72	0.011	1.69	3.95	2.95	91.41