

UNIVERSITY OF GHANA

**FINANCIAL DEEPENING, TRADE OPENNESS, AND ECONOMIC
GROWTH IN WEST AFRICA**

BY



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DECEMBER, 2013

DECLARATION

I hereby declare that “*Financial Deepening, Trade Openness and Economic Growth in West Africa*” is the result of my own research and has not been presented by anyone for any academic award in this or any other university. Any scholarly works that have been quoted or cited have also been duly acknowledged by means of referencing.

I bear sole responsibility for any shortcomings.

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CERTIFICATION

We hereby certify that *“Financial Deepening, Trade Openness and Economic Growth in West Africa”* was supervised in accordance with procedures laid down by the University.

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DEDICATION

This work is in honour of my mum, Basoh, Godfred and all my siblings for their benign love for me. It is also written in honour of my late granny and all those who solemnly trust in my abilities.

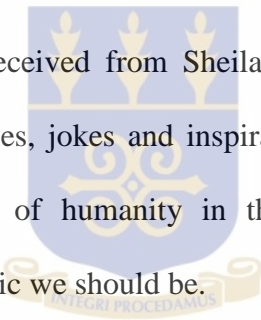


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The shortcomings of this thesis, in no way, have anything to do with the aforementioned contributors; I am solely responsible.

Bernard Njindan Iyke

December, 2013

ABSTRACT

The dilemma concerning the choice between austerity and stimulus packages has reignited the finance-growth debate. This study joins the debate to examine the linkages between financial deepening, trade openness and economic growth in selected West African countries. The study looks at the two monetary zones in West Africa, namely the West African Monetary Zone (WAMZ) and West African Economic and Monetary Union (WAEMU). Using a panel data of twelve (12) countries covering 1992—2009 period, the study finds that financial depth, trade openness and economic growth are non-stationary in both WAMZ and WAEMU. This means that the variables cannot be used for policy forecasting, when in their levels.

The study also finds that all three variables are not cointegrated in WAMZ and WAEMU; hence, no panel error correction model was required for the causality tests. Finally, the study performs the Granger Panel Causality Test in a trivariate VAR and found that causality runs from financial deepening to economic growth through trade openness for countries of both WAMZ and WAEMU.

The study concludes that financial deepening produces positive economic growth. However, this was possible if the trade sector was liberalised to allow global participation in the local markets. It recommends suitable policies that enhance both financial sector and trade sector development, such as the existence of a strong common currency, the liberalisation of interest rates, the reduction in government interference (in both the trade and financial sectors), improved bilateral and multilateral trade agreement which benefits all parties.

The study predicts favourable economic growth in both WAMZ and WAEMU when these policies are put in place.

Keywords: Financial Deepening, Trade Openness, Economic Growth, Panel Unit Roots, Panel Cointegration, Panel Granger Causality, WAMZ, WAEMU, Panel Data, PCA, West Africa.

LIST OF ABBREVIATIONS

Acronym	Meaning
BOP	Balance of Payment
FEM	Fixed Effects Model
GDP	Gross Domestic Product
GSE	Ghana Stock Exchange
IMF	International Monetary Fund
M2	Broad Money Supply
NSE	Nigeria Stock Exchange
PCA	Principal Component Analysis
SLSE	Sierra Leone Stock Exchange
SSA	Sub-Saharan Africa
REM	Random Effects Model
VAR	Vector Autoregression
VECM	Vector Error Correction Model
WB	The World Bank
WAEMU	West African Economic and Monetary Union
WAMI	West African Monetary Institute
WAMZ	West African Monetary Zone

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CHAPTER ONE

INTRODUCTION

1.1 Background

The links between financial deepening, trade openness and economic growth have gained considerable attention because the determination of the causal patterns between these variables has important implications for policy-makers' decisions about the appropriate growth and development policies to adopt. For instance, many developing countries have adopted liberalization as a way of improving the performance of the various financial intermediaries, nursing the ambition that a strong financial performance will drag up economic performance.

Since 1970, many economies in the developing world have undertaken economic reforms, including restructuring their financial systems (Odhiambo, 2008; Gries et al, 2009; Akinlo and Ebgetunde, 2010), with the aim of fostering financial development and economic growth.¹ Notable among the major financial reform measures were the liberalization of interest rates, privatization of banks, and the reduction of government interventions. Such reform measures were expected to promote growth through higher mobilization of savings for investments and improvements in the efficiency of the financial sector. However, the capacity of the reform measures to enhance economic growth in these countries requires a strong causal relationship between the financial sectors and real sectors (Gries et al, 2009).

¹ According to Graff (2001; pp. 47), financial development could be viewed as the increase in the volume and variety of financial services and banks in the financial intermediation process.

Outward-looking policies (trade liberalisation) are well-known to enhance the development of countries, especially, when well-guided. Well-designed trade reforms could increase the revenues from trade; with appropriate financial development-promoting reforms, many financial institutions and intermediaries should emerge to identify the excess unused gains from trade, and thus direct them to sectors which demand these funds most. If the economies allow free emergence of financial institutions and intermediaries, competition among these financial institutions for clients will ensure that they deliver loanable funds at competitive market rates to firms and individuals that demand the loans most. Competitive interest rates minimise the risk of adverse selection, and thus reduces bad loans. Once the right candidates are offered loanable funds, the assumption is that they will use it efficiently and will thus pay back. Efficiency in the usage of idle funds has two implications: a) the surplus spender gains value on her funds by issuing it out through an intermediary as loans, and b) the deficit spender has access to the required funds for her investments. This flow channel of economic activities enhances economic growth. The mechanism self-replicates, when as a result of economic growth, the demand for complex financial services emerges, and policymakers see more avenues for trade, and further open up their trade sectors (McKinnon and Shaw, 1973; Jung, 1986).

The finance-growth debate has been widely documented in economic literature. Till now, there has not been any agreement among economists as to whether finance *causes* growth or growth *causes* finance. A popular notion is that a strong economic growth is finance-led. This was first observed in earlier

works including that of Schumpeter (1912). The Schumpeterian² school of thought was of the view that the banking system could engineer money creation and channel it into productive and innovative uses. They also claimed that it was the information gathering and processing, accomplished by dealers in credit and capital markets, which helped to improve the efficiency of capital allocation (Graff, 2001). Robinson (1952) refuted this claim by arguing that it was the development of the real sector, which led the development of the financial sector. She concluded that, “*where enterprise led, finance followed*” (Robinson, 1952, p. 15).

Although Schumpeter (1912) was generally acknowledged as the first proponent of the supply-leading theory of finance, the support for the supply-leading response can be traced as far back as Bagehot (1873) and Smith (1776). Bagehot (1873) argued that the financial system played a critical role in igniting industrialisation in England by facilitating the mobilisation of capital for “immense works”. It was this view that Schumpeter (1912) echoed, when he argued that finance led economic growth and that financial institutions were important elements for the development of a capitalistic economy. Smith (1776) was quite sceptical about his observations. Smith (1776) indicated that the pace at which the city of Glasgow expanded could be due to the springing up of banks, particularly the Bank of Scotland and the Royal Bank, in the 1790’s. During this era, Smith (1776) noted, the trade of the city of Glasgow doubled and industry expanded.

²Used often to describe economists who follow Schumpeter’s ideologies.

In what has become known as Gerschenkron's Hypothesis, Gerschenkron (1962, 1966) claimed that the banking system was very instrumental in the industrial revolution of the "latecomers". He based his argument on the "relative backwardness" of countries with respect to capital and entrepreneurship. Gerschenkron classified Britain as the "pioneer", Germany as "moderately backward" and Russia as "extremely backward". Countries relatively backward to Britain, which lacked the capital and entrepreneurship for economic growth, resorted to institutional innovations. These relatively backward countries, Gerschenkron argued, learned from mistakes of the pioneer (Britain) and avoided replicating what was created already. Gerschenkron saw the banking sector as a typical innovative vehicle with which the latecomers travelled in their quest for industrial revolution. Britain, being the pioneer, did not move fast in the industrialization process since it took time to plan. The role of banks in British industrialization was less pronounced as capital was mobilized from agriculture and trade. The latecomers (France, Germany, Japan, and Russia) used the banking sector to an astronomical effect in starting and pushing the industrialization process.

Patrick (1966) made an audacious attempt to reconcile the two contradictory theories by arguing that the direction of causality between financial development and economic growth changes over the course of development. In his seminal paper, Patrick (1966) claimed that financial development is able to induce real innovation of investment before sustained modern economic growth gets underway, and, as modern economic growth occurs, the supply-leading impetus reduces little by little as the demand-following response

becomes dominant. This sequential process, he added, was also likely to occur within and among specific industries or sectors.

Nevertheless, the empirical evidence for these views are open to debate. Graff (2001) observed that: First, the factors that govern economic growth admittedly include many others besides financial development, and interactions among them are likely to prevail. Second, mutual causation, may be the rule rather than the exception, making it difficult, if not impossible, to rule out a specific hypothesis. Third, whereas selected evidence from economic history is supportive, the general picture is rather inconclusive. Fourth, the existing quantitative data on financial development underlying the recent econometric studies are plagued by poor reliability and dubious validity (Loizides and Vamvoukas, 2005; Gries et al., 2009). Moreover, what may be an adequate financial system at one time or in one social, institutional, and economic environment may be outright detrimental at another time or in other environments. In other words, there may be various structural shifts or breaks³ that further complicate identification of causal relationships.

Earlier versions of the finance-growth debate that employed bivariate models are exposed to omission-of-variable bias (Gries et al, 2009, Odhiambo, 2008). This is because other factors may intervene in the finance-growth relationship. Neglecting them, therefore, produce poor conclusions and policy recommendations. In light of this, the frontier of the literature in this field is shifting towards providing explanation to the important variables ignored in the finance-growth nexus. Some of the main variables which have been found

³ See Gerschenkron (1962) for further discussion of this issue

to be crucial in the finance-growth nexus are trade openness, financial openness, savings, investment (both foreign direct investment and portfolio investment) and inflation.⁴ The choice of trade openness⁵ as the key intervening variable is due to: 1) the theoretical relationship between trade openness and financial deepening, and 2) the theoretical relationship between trade openness and economic growth.

An important argument worth considering is whether trade openness causes financial deepening or not. This argument is worth examining for two reasons: first, if trade openness causes financial deepening or vice versa, then the conclusions of studies that considered only finance and economic growth cannot be taken seriously, and second, if trade openness does not cause financial deepening, then the role of trade sector liberalization on the finance-growth argument can totally be ignored. In a hypothesis developed by Rajan and Zingales (2003), it was argued that interest groups, especially, industrial and financial incumbents frequently stand to lose from financial development. This is because financial development opens up avenues for new firms to become established⁶, leading to competition which erodes incumbents' rents. In their view, the incumbents' opposition to financial development will soften when an economy opens up both its trade and capital accounts. They argued that trade openness and financial openness not only curtails the ability of the incumbents to prevent the development of financial markets but may also

⁴ See Baltagi et al, (2009), Harrison (1996), and Odhiambo (2008) for details.

⁵ Trade openness defines a situation where a country opens up its borders, allowing international trade (Harrison, 1996)

⁶ Financing has always been the main obstacle to firms' growth, especially small firms. When the financial sector is well-developed, funds will be available for all firms to procure and thus increase their competitiveness.

create incentives for them to adopt a different stance towards financial development.

The Rajan-Zingales Hypothesis implied that trade openness without financial openness was not likely to deliver financial deepening. They implied that trade openness without financial openness would rather result in financial repression and loan subsidies, so that the incumbents obtained enough but cheap loans to face competition. They claimed that financial openness alone would not lead to financial development as the largest local companies would tap cheaper foreign credit at the expense of the smaller local companies. The financial sector will therefore suffer due to the decline in profits. In passing, this hypothesis suggested that a combination of trade and capital account liberalization was necessary to realize financial development, which in turn pushes up economic growth. Empirical work, such as Baltagi et al (2009), lent partial support to this hypothesis. Baltagi et al (ibid) found in their study that the marginal effects of trade (financial) openness are negatively related to the degree of financial (trade) openness, implying that relatively closed economies stand to benefit most from opening up their trade and (or) capital account.

In similar development, the enthusiasm by growth theorists to explain the sources of economic growth and development has reinvigorated the trade-growth debate. In the basic Solow Model, proposed by Solow (1956) and Swan (1956), technological change was held constant barring the impact of trade on growth.⁷ In new growth models, however, trade policies determine, to a considerable extent, the long-run growth path via technological change.⁸

⁷See, for instance, Mankiw, Romer and Weil (1992) for further insight.

⁸ See, for instance, Grossman and Helpman (1992)

External trade, therefore, provides technological spillovers, and increases the market size for local producers. This raises the returns to innovation and affects a country's specialization in research-intensive production (Harrison, 1996). If this new development in the trade-growth debate held sway, then trade openness would only lead to an increase in economic growth, which would increase the demand for financial services, other things remaining constant.

A drawback of the new growth theories is their inability to predict that trade will unambiguously raise growth. Schumpeter (1912) argued that external trade, if not properly checked, would promote unhealthy competition among local industries and multinational conglomerates. Increased unhealthy competition, according to Schumpeter, could discourage innovation by lowering rents. Grossman and Helpman (1992), in particular, indicated that trade intervention could raise long-run growth if protection promotes investment in research-intensive sectors for countries with a competitive advantage in these kinds of goods.

Many studies have produced mixed and conflicting findings on the nature and direction of the causal relationships between finance, openness and economic growth (Demetriades and Hussein, 1996). While some studies identified unidirectional causal relationships between finance, trade openness and growth (Pagano, 1993; King and Levine, 1993), others found bidirectional causal relationships (Al-Yousif, 2002). Strangely, some studies even found no causal relationship between the three variables (Chandavarkar, 1992).

This thesis assesses the relationship between financial deepening and economic growth, capturing indirect linkages by scrutinizing the relationship between finance and trade openness for twelve (12) West African countries. In so doing, the study may contribute to the existing literature on the finance-growth nexus.

1.2 Statement of the Problem

During the sixties and the seventies, economies of most West African countries persistently performed poorly (World Development Report, 1989). Evident among the poorly performed macroeconomic indicators were the increase in government debts, rise in inflation rates, balance of payment problems, negative real interest rates, and a continued deteriorating infrastructure⁹. This poor economic performance aroused the interest of many prominent policy-makers and economists. The aim of these policymakers and economists was to identify the causes of the poor economic performance, and thus prescribe the policy measures to counter this problem.

The policy recommendations of the McKinnon-Shaw Hypothesis (1973), which dominated economic literature in the late 1970's, were the centrepiece of International Monetary Fund (IMF) and World Bank (WB) policy prescriptions to many of these West African countries. Notably was the drastic transformation of the financial and trade sectors, hitherto referred as *repressed sectors*¹⁰, to pave way for economic growth and development. This financial

⁹ See World Development Indicators (1970) compiled by World Bank

¹⁰ McKinnon and Shaw (1973) were the first scholars to use this term in their pioneering works to describe the nature of the economy under the controlled system. In their independent analysis of the financial repression and financial shallowing thesis, McKinnon (1973) and

liberalization yielded some success, as many of the West African economies experienced moderate GDP growth, reduced inflation rates, increased in real rates of interest, increased in M2 to GDP, fall in government debts, and improved net export (World Development Report, 1989). However, over time, many of these West African economies could not sustain the initial success; they soon experienced economic slowdown; interest rates have been increasing, government debts are rising, export has been declining, and inflation rates have been increasing.¹¹ Economists are now beginning to question the policy recommendations of the McKinnon-Shaw Thesis as a result.

Empirical studies attempted to determine whether financial sector performance spurs economic growth or not. Levine (1997), Zingales (1998) and, End (2005) concluded in their studies that strong economic performance follows financial sector development. On the other side of this debate, Demetriades and Hussein (1996), Agbetsiafa (2004), and Odhiambo (2008) concluded in their studies that financial sector development is growth-driven. Patrick (1966), Greenwood and Jovanovic (1990), Wood (1993), Greenwood and Bruce (1997), and Luintel and Khan (1999) are all of the view that there is a feedback effect between financial sector development and economic growth. Other empirical studies that are consistent with the bi-directional causality

Shaw (1973), respectfully, argued that financial repression—indiscriminate 'distortions of financial prices including interest rates and foreign-exchange rates'—reduces 'the real rate of growth and the real size of the financial system relative to nonfinancial magnitudes. In all cases this strategy has stopped or gravely retarded the development process' (Shaw, 1973, pp. 3-4).

¹¹ If the McKinnon-Shaw Hypothesis was anything to go by, these turn of events were not to be expected. This sad experience was what casted doubt on the policy recommendations proposed by McKinnon and Shaw (1973)

response are Akinboade (1998), Al-Yousif (2002), and Demetriades and Hussein (1996). On the fence of this exciting debate are Roubini and Sala-i-Martin (1993), De Gregorio and Guidotti (1995), among others who revealed a strange finding in their studies—that no linkages can be found between financial development and economic growth.

Although, most studies do not capture trade openness in the finance-growth debate—something which Odhiambo (2008) hints could have resulted in omission-of-variable bias—Beck (2003), Svaleryd and Vlachos (2005), and Law (2009) took a close look at finance and trade linkages and concluded that there is a feedback effect between them. Similar conclusion was reached by Harrison (1996) and Edwards (1998). Harrison (1996), however, studied the linkages between trade openness and economic growth. She detects a bidirectional effect between trade openness and economic growth. She adds that as countries open up their trade sectors, technology flow into them; besides, they also widen their market base and as are exposed to external competition which promotes efficiency and productivity. The productivity gains from trade necessitate the need for further liberalisation to trade domestic excesses.

The nature of the above findings and many other findings do not seem to converge. Nagging problems remain, especially when it is taken into consideration that the policy recommendations have vital roles to play in economic development in the countries and sub-regions in which these studies were conducted. The major weakness of the available empirical literature is the manner in which other essential variables were ignored (Loizides and Vamvoukas 2005). Theory held that saving, investment, trade, interest rates,

exchange rates, inflation, government spending and foreign direct investment relate to both finance and economic growth (Gries et al, 2009). For instance, finance is required for investment, and investment is required for growth. Also, inflation stifles the development of financial intermediaries by increasing nominal interest rates—which discourages genuine borrowers; when financial intermediaries die off due to inflation, deficit spending units find it difficult to get funds for investment; as investment slows down, so does growth. Economic variables, such as finance, investment, inflation, saving, and growth are intricately interrelated. Thus, inferences resulting from using only finance and growth should be drawn with extreme caution (Odhiambo, 2008).

Similarly, the finance-growth debate has been documented widely but mainly concentrating on countries in Asia, Latin America and the Caribbean, ignoring West African countries. Besides, many of these studies have used bivariate frameworks to scrutinise the causal relationship between financial development and economic growth. However, it is now clear that the results of the bivariate causality test between financial development and economic growth may be invalid due to the omission of important variables affecting both financial development and economic growth in the causality model. As argued by Loizides and Vamvoukas (2005), when a third variable is introduced into the causality framework, it may not only alter the direction of causality but also the magnitude of the estimates. Although, this new development may seem redundant, if the previous bivariate models best explained the finance-growth relationship, that was not the case. The omitted variables are found to be significant (Loizides and Vamvoukas, 2005).

Again, some of these studies have used cross-sectional approaches, which generalises the causal link between financial deepening and economic growth across countries (Odhiambo, 2008). A standout weakness of using cross-sectional approaches is that by grouping countries that are at different stages of financial and economic development, it fails to address the country-specific effects of financial development on economic growth and vice versa. Specifically, the method fails to explicitly address the potential biases induced by the existence of cross-country heterogeneity, which may lead to inconsistent and misleading estimates.¹²

The current study differs from previous ones by virtue of the fact that it adds trade openness to the already known finance-growth debate, and because it employs panel rather than cross-sectional or time series data. In what follow, the study seeks to find out answers to the aforementioned problem by investigating the causal links between financial deepening, trade openness, and economic growth in twelve (12) selected West African countries using a trivariate panel framework. The study will also scrutinize the short-run and long-run cointegrating relationships between these variables using a panel error-correction model, which is more robust than the casual time-series or cross-sectional models of cointegration.¹³

¹² See Quah, 1993; Casselli et al, 1996, Ghirmay, 2004

¹³ Panel data pools together cross-sectional and time series dimensions. As a result, the sample size increases. There is efficiency gain in estimation when data size increases. This makes panel causality models more robust than cross-sectional or time series causality models.

1.3 Objectives of the Study

The main priority of this study is to investigate the causal relationships between financial deepening, trade openness, and economic growth in twelve (12) selected West African countries.

Specifically, this study will aim at:

- estimating the short-run and long-run relationships between economic growth, financial deepening and trade openness.
- testing the causality between financial deepening, trade openness and economic growth

1.4 Statement of Hypotheses

In line with achieving the above objectives, the study will test the following hypotheses:

- There is a causal relationship between financial deepening and trade openness
- There is a causal relationship between trade openness and economic growth
- There is a causal relationship between financial deepening and economic growth
- There are cointegrating relationships between the three variables

1.5 Justification of the Study

The intention of this contribution is to assess whether financial deepening has actually influenced economic development in West African countries and whether trade and financial liberalization strategies are appropriate policy tools for fostering regional development.

Previous empirical works on the finance-growth debate are inconclusive, motivating this research. Besides, most of these studies have concentrated mainly on the use of the bivariate causality test. Empirical evidence have shown that bivariate causality test suffers from the omission-of-variables bias (Odhiambo, 2008; Gries et al, 2009). This study will add to the existing literature by:

- Using econometric methods that are less prone to common methodological misspecifications that occur when testing for causality
- Employing a composite indicator of financial deepening in order to proxy financial depth in a broad sense
- Carefully distinguishing between short-run and long-run effects between finance, openness and growth
- Taking into account the linkages of finance and openness that allow for further influences on economic development.

1.6 Organisation of the Study

The study is study organized as follows: The current chapter deals with the introduction of the study which captures the background to the study, statement of the problem, the objectives of the study, the research hypotheses,

the justification of the study, and the organization of the study. Chapter two covers the literature review, summarizing the existing theoretical and empirical literature. Chapter three provides the overview of West African economies, inter alia, financial development and financial sector reforms, trade volume, trade policies, and GDP growth. Chapter four takes a closer look at the methodology and the various methodological issues in this study. Chapter five presents and discusses the results and findings. Chapter six deals with summaries of the findings, conclusions and the policy recommendations emanating from the study. Besides, it discusses the limitations of the study and recommendations for future study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter considers the theoretical and empirical literature on the finance-growth debate. It is presented in four sections. The first section examines the meaning of financial deepening, trade openness and economic growth and the linkages between them in the literature. The second section discusses the theoretical literature; in the context of McKinnon-Shaw, Neo-Structural, Endogenous Growth and Asymmetric Information Models. The third section considers the empirical evidence of the finance-openness-growth nexus, by classifying these findings into: 1) growth is finance-led, 2) finance is growth-driven, 3) bidirectional effect between growth and financial deepening, 4) finance and trade openness are related, and 5) finance-openness links and growth. The final section presents the conclusions drawn from the theoretical and empirical literature.

2.2 Definitions and Theoretical Issues

2.2.1 The Meaning of Financial Development

Attempts have been made to capture what constitute financial development¹⁴ empirically. Generally, when an economy experiences financial deepening, it is agreed that the financial sector of that economy is developing. Increases in

¹⁴ A crucial part of this term is financial deepening. For this reason, it is often used synonymously with financial deepening. Whenever financial deepening is used in this study, financial development is implied.

ratios such as private credit to GDP, capitalization to GDP, and M2 to GDP are indicators of financial deepening.

However, if the concept of financial development is limited to financial deepening, a vital component of the process is taken away. Goldsmith (1969) noted that an indicator of financial development is the springing up of various financial institutions and instruments (in other words, the expansion in the financial superstructure). Goldsmith attempted to provide a measure for financial development through his Financial Interrelations Ratio (FIR). This, according to Goldsmith, is “the quotient of the aggregate market value of all financial instruments in existence in a country at a given date to the value of its tangible net national wealth”. According to Goldsmith, the higher the FIR, the higher the level of financial development and vice versa.

Rajan and Zingales (1998) argued that an appropriate measure of financial development should capture the ease with which deficit spending units acquire loanable funds to finance sound projects. They concluded that a well-developed financial system should be able to forecast and hedge risk in cost effective manner. The important contribution of their view to the meaning of financial development is the risk forecasting and hedging component.

Another aspect of financial development is the legal and institutional framework. According to Fry (1995), a developed financial system has adequate prudential regulation and supervision of commercial banks. In the case of securities aspect of financial development, sound regulatory and supervisory frameworks are in place to prevent practices, such as, false trading, insider trading, and agency problems. Fry (1995) identified four other

signals of financial development: (1) significant level of price and exchange rate stability, (2) fiscal discipline in form of sustainable government borrowing (from the central bank) which does not put inflationary pressures on the reserve money or a sustainable government borrowing (from external sources) which does not increase capital inflows meriting large purchases of foreign currency by central bank to avoid exchange rate appreciation, (3) competitive profit-maximising attitude by commercial banks, and (4) a tax regime devoid discriminatory explicit or implicit taxes on financial intermediation.

The conclusion that could be drawn from the above views is that financial development is a process. This process could be grouped into three distinct parts: (a) the development of financial institutions, (b) the development of varied and complex financial instruments and services, and (c) sound regulatory and supervisory frameworks to prevent the financial institutions and intermediaries from indulging in malpractices which may put the economy at risk. A good measure of financial development should capture the ease with which loanable funds get to those who need them most, and the pace at which financial institutions develop to meet changing demands of financial services.

2.2.2 Views on Trade Openness

A critical issue researchers had to deal with is the definition of trade openness.¹⁵ Since the definition helps in the appropriate choice of proxies to be used in empirical study, it is worthwhile considering what constitute trade

¹⁵ This so because what constitute trade openness differs from country to country and from time to time (Krueger, 1978).

openness. The concept of trade openness has been undergoing modification. Krueger (1978) analysed ways in which trade liberalisation could be attained, using economic policies that lowered the biases against export. In Krueger's view, a country could have its economy opened using a favourable exchange regime for its exports and protect its import sector through trade restrictions. In Krueger's words, "a regime could be fully liberalised and yet employ exceedingly high tariffs in order to encourage import substitution". Such an economy could be thought of as an opened, yet guided.

Harrison (1996) argued this out differently. To Harrison, the idea of openness is likened to neutrality, when employed in trade policy debate. The neutrality idea implies the state of being indifferent between saving a unit of foreign exchange via import substitution and earning a unit of foreign exchange via exports. Viewed in this sense, we could deduce that a highly export-dominated country was unlikely to be neutral, especially if the country were to favour export production using such instruments as export subsidies (Harrison, 1996). Harrison also claimed that there was a possibility that a regime could be neutral, although interfering in some sectors. Harrison concluded that an appropriate measure of trade policy should capture the variances among neutral, inward oriented and export-promoting regimes.

In recent trade literature, the idea of trade openness connotes *free trade* (a trade system without restrictions and distortions). The attention is now shifting to the better understanding of what constitute an appropriate measure of openness, as this has conceptual implications for growth theory (Edwards, 1993). Leamer (1988) attempted to provide a simple measure of openness which uses a theoretical model to forecast the pattern and volume of trade in

the absence of restriction. In this bold attempt, Leamer defined openness as a function of the extent to which actual trade deviates from the pattern of trade predicted by the theoretical model. Edwards (1992) has used Leamer's measure to show that openness has a positive and statistically significant impact on growth. Pritchett (1991) has shown that Leamer's openness measure is inversely related to other measures of openness, such as import penetration, quotas, and tariffs.

In view of the above discussion, trade openness could be seen as a situation where a country makes its trade policies flexible to the external environment. An open economy, with respect to trade, is one which has succeeded in liberalising its trade sector to allow for foreign competition. The more outward-looking a country's policies, the more opened it is and vice versa. An appropriate measure of trade openness should consider the size of the sum of export and import to gross domestic product. Using this proxy as a measure of trade openness, a more opened economy should have a higher export plus import to GDP ratio than a less opened economy.

2.2.3 Meaning of Economic Growth

Economic growth is an increase in the real level of national output of a country (Seers, 1959; Todaro and Smith, 2011). It is a continuous improvement in the capacity to satisfy the demand for goods and services, resulting from increased production scale, and improved productivity. There are different concepts of economic growth and ways of measuring it, but the core definition is in terms of growth in the long run productive capacity of the economy, typically measured by growth in real gross domestic product (real

GDP). Broader concepts of growth such as sustainable (balanced) growth or growth in measures of wellbeing are closer to welfare objectives but more complicated and harder to measure.

Growth-oriented policies tend to focus on the growth in output per capita because it is more closely related to social welfare objectives.¹⁶ Growth in output per capita can be broken into growth in the employment rate and in output per worker. There is a limit to how far the employment rate can be improved in the long run in developing countries; so long run growth is driven primarily by productivity (Krugman, 1979). Over the longer period, growth will be determined primarily by the factors which determine productivity, and secondly those which improve labour participation (Krugman, 1979). The drivers of productivity growth are factors which either improves the quality of outputs, or the efficiency with which inputs are transformed into outputs. The contribution of some of these factors to output growth can be captured by appropriate inputs measures, with everything else allocated to total factor productivity (TFP).¹⁷

In the Solow (1956) and Swan (1956) neoclassical growth models, a one-off increase in inputs to increase the scale of production only has an impact on per capita output growth in the short run, while technical progress makes a persistent contribution. In endogenous growth models, investment—especially in innovation—drives technical progress, so has an impact on growth in the long as well as in the short run, (Grossman & Helpman, 1992).

¹⁶ Output per capita explains how much each person in an economy will get if the total domestic income were to be shared. The World Bank and IMF use this as an indicator of welfare improvement. Available data show that rich countries have high output per capita than poorer countries.

¹⁷ See, for instance, Todaro and Smith (2011)

Early theories focussed on understanding economic growth, and attempted to find general determinants of growth that could be applied to any instance under consideration. By looking at patterns of growth the hope was to discover some of the laws or principles which govern growth at all times and in all countries. Modern theories tend to accept that conditions for growth change over time, and are often more critical of the attempts to generate *one-size-fits-all* growth theories.

The current growth debates are now shifting toward the endogenous theory of growth, which emphasize the crucial role of technical progress via innovation. To this end, the importance of trade openness (which enhances technological transfer) to economic growth cannot be overemphasized. The main measure of economic growth as accepted, for instance, by the World Bank and IMF is real per capita GDP. This study embraces the endogenous growth model because it adequately captures the role of financial deepening and trade openness in economic growth; it employs real per capita GDP growth as the measure of economic growth.

2.2.4 Financial Development and Economic Growth Linkage

The finance-growth nexus has received much attention in theoretical and empirical literature due to its implications for development policy (World Bank, 1989). The theory underlying this relationship dates back to the writings of Schumpeter (1912) and, more recently, to McKinnon (1973), Shaw (1973) and their followers (Kapur, 1976; Galbis, 1977; Fry, 1978, 1980, 1988; Mathieson, 1980). The most dominant arguments were those put forward by McKinnon (1973) and Shaw (1973).

The key policy implication of the McKinnon-Shaw thesis is that government restrictions on the banking system—interest rate ceilings, high reserve requirements and directed credit programmes—hinder the process of financial development and, consequently, reduce economic growth. The endogenous growth models had similar conclusion. These models suggest that financial deepening has a positive effect on steady-state growth (Greenwood and Jovanovic, 1990; Bencivenga and Smith, 1991) and that government intervention in the financial system has a negative effect on the growth rate (King and Levine, 1993).

2.2.5 Financial Development and Trade Openness Linkage

The link between financial deepening and trade openness has garnered little attention in literature. This may be due to the blurred nature of these two variables when considered simultaneously. Nevertheless, models of international trade expound the comparative advantage of countries with differences in technology or bequests. The Heckscher–Ohlin model is suitable when portraying the effect of financial sector development on international trade flows (Beck, 2003).

One of the pioneering models in which financial markets are a source of comparative advantage was developed by Baldwin (1989). In this two-country, two-sector, and one-factor model, the demand for one of the goods is subject to demand shocks, while the other is not. Baldwin was able to show that economies with better-developed financial markets are better equipped to diversify risks associated with producing the good that is subject to the

demand shocks than countries with less-developed financial markets. This means that firms in countries where the financial markets are well-developed face lower risks and marginal costs in producing the risky good than their counterparts in countries with less-developed financial markets. It pays, therefore, for countries with better-developed financial systems to specialise in the risky good.

Unlike Baldwin (1989), Kletzer and Bardhan (1987) focused on the role of financial institutions and markets in channelling external finance to industries that are in need of it. They presented two international trade models in the Heckscher–Ohlin tradition with two countries, two sectors, and two factors. While both sectors depended on land and labour, one sector depended on external finance for working capital. They showed that the country with a lower level of credit market restrictions specializes in the sector that uses external finance. The country with the higher level of credit market restrictions faces either a higher price of external finance or credit rationing and will therefore specialize in the sector that does not require working capital or external finance (Beck, 2003).

Possible linkages between finance and trade openness open up further channels through which financial and real sectors may interact. Matured financial markets may constitute a comparative advantage for industrial sectors that rely heavily on external financing (Beck, 2003). When there is a strong link between the financial sector and the trade sector, industries in the trade sector will gain an edge in competing against Multinational Corporations, since they will not have to depend anymore on external finance,

which usually comes at high costs. Thus, economies with developed financial systems are expected to feature industrial and trade structures that are linked to finance-dependent sectors of the economy. On the contrary, increased trade openness may trigger demand for new financial products. Trade carries risks linked to external shocks and foreign competition. Therefore, an increase in trade openness may lead to a supply of more sophisticated financial instruments; in such an environment, financial institutions are expected to evolve so as to provide more adequate insurance and risk diversification (Svaleryd and Vlachos, 2002). Furthermore, domestic interest groups may have a natural interest in obstructing financial development to prevent competitors from entering the market; as international competition increases, such groups may shift their interests toward positive financial sector development, creating another link between the trade and financial sector (Rajan and Zingales, 2003).

2.3 Theoretical Literature

Basically, there are four models that explain the underlying relationships between financial deepening, trade openness, and economic growth: 1) McKinnon-Shaw Model, 2) Neo-Structural Model, 3) Endogenous Growth Model, and 4) Asymmetric Information Model.

2.3.1 McKinnon-Shaw Model

In an attempt to challenge the dominant Neoclassical¹⁸ and Keynesian¹⁹ theories of money and financial development, McKinnon (1973) and Shaw (1973) came out with what is today known in the economic literature as the financial repression thesis. Their main line of argument is that financial repression—indiscriminate distortions of financial prices including interest rates and foreign-exchange rates—reduces the real rate of growth and the real size of the financial system relative to nonfinancial magnitudes. In all cases this strategy has stopped or gravely retarded the development process (Shaw, 1973). Both models argue that the removal of the ceilings on deposits results in positive real interest rates which increases saving required for investment, and economic growth.

Distinguishing features of the McKinnon-Shaw model are: a saving function which is positively related to real interest rates on deposits and a real rate of output growth; an investment function which is negatively related to the real effective rate of interest on loanable funds and positively related to the rate of output growth; an artificially pegged nominal rate of interest which keeps the real rate below the equilibrium level; and loanable funds which are inefficiently non-price rationed (McKinnon, 1973; Shaw, 1973).

In the McKinnon-Shaw Model, financial intermediaries allocate loanable funds to deficit spending units not based on the expected return on their

¹⁸ This term is used in economic literature to refer to theories put forward by the late Milton Friedman—the famous 21st century economist and Nobel Laureate who died in 2006.

¹⁹ Just as the above term, this term is often used when referring to theories propounded or related to John Maynard Keynes, another influential English economist, whose pioneering work on income, interest, and employment engineered the beginning of the downfall of classical ideologies.

investment projects but to the transaction costs and the possible risks of loan default. Other factors, not excluding reputation of the incumbent, loan size, quality of collateral, benefits to loans officers, political influences among others, may determine the apportionment of loanable funds. The problem that arises here is that even if the allocation of loans is done randomly, the average efficiency of investment will decline as the low credit ceiling favours investments with lower returns which now prove profitable. Deficit spending units, which could not procure loanable funds then, will now enter into the credit market. The default-prone deficit spending units will be selected due to extremely low interest rates which is the adverse selection problem (Fry, 1997).

Fry argued that the lending and deposit rates ceiling maligned the economies in four distinct ways (Fry, 1995, 1997). First, the low interest rates induced economic units to sacrifice future consumption for current consumption, which reduced saving for future consumption below the socially optimal level. Second, prospective savers give preference to investment in low-yielding assets instead of piling up their money in banks and other financial institutions. Third, deficit spending units tend to invest in relatively capital-intensive project, given that they are able to secure the maximum loans from formal financial institution at cheaper loan rates. Finally, the prospective borrowers at this level of interest rates are a pool of investors undertaking low-yielding projects, who otherwise would not have borrowed at the competitive level of interest. As a result of the low lending rates, financial institutions earn less income, hence are not motivated to spend money on collating information concerning prospective borrowers. Financial institutions with externally

determined interest rates will show preference for low risk projects, since financial institutions are striped from charging the high risk premia associated with return projects. Consequently, many projects which have returns lower than the threshold level of returns are selected. These projects would not have been taken up with market-clearing rates.

Raising the interest rate ceiling towards its competitive free-market level increases both saving and investment. Changes in the real interest rate trace out the saving function in this disequilibrium situation. Raising the interest rate ceiling also deters entrepreneurs from undertaking all low-yielding investments that are no longer profitable at the higher real interest rate. Hence the average returns to or efficiency of aggregate investment increases. The output growth rate rises in this process, so further increasing saving. Thus, the real rate of interest as the return to savers is the key to a higher level of investment, and as a rationing device to greater investment efficiency. The increased quantity and quality of investment interact in their positive effects on the output growth rate. Growth in the financially repressed economy is constrained by saving; investment opportunities abound here (McKinnon, 1973; Shaw, 1973). The policy prescription proposed by McKinnon and Shaw is to raise institutional interest rates or to reduce the rate of inflation. Abolishing interest rate ceilings altogether produces the optimal result of maximising investment and raising still further investment's average efficiency (Fry, 1995, 1997).

Although the above analysis illustrates the important common points of the McKinnon and Shaw representation of the financial repression/liberalization

model, there are also some differences in the formulation of this thesis. McKinnon (1973) bases his analysis on an outside money model while Shaw's (1973) model is an inside money model. According to Gurley and Shaw (1960), outside money is backed by government securities and a change in its real value, as the price level rises, indicates a change in private wealth in favour of the government. Inside money is money issued on the basis of private bonds purchased by the government. However, any change in it does not alter private wealth since its basis is an internal debt to this sector. As Fry (1995) indicates, if all money is outside money, banks do not extend loans to the private sector. Nevertheless, this difference in the formulation of McKinnon's and Shaw's models acquires its meaning in the context of their second difference concerning the sources of funds to finance investment.

McKinnon makes the assumption that economic units are constrained to self-finance and also that there is a kind of "finance motive" for demand for money—in the sense of Keynes (1937)—since investors accumulate money balances before implementing their lump-sum investment expenditures. Indivisibilities in investment are assumed on the basis of the small size of firms in LDCs. Hence, McKinnon establishes a "complementarity" between money and physical capital that is reflected in his demand for money function

$$\frac{M^D}{P} = f\left(Y, \frac{I}{Y}, d - \pi^e\right) \dots\dots\dots (1)$$

with all partial derivatives of $f(\cdot)$ and especially $\frac{\partial f(\cdot)}{\partial(I/Y)}$ being positive.

In this relation M is the money stock (saving, time and sight deposits and

currency in circulation), $\frac{I}{Y}$ is the ratio of gross investment to gross national income and $d - \pi^e$ is the real deposit interest rate. Hence, the complementarity hypothesis states that demand for physical capital (demand for investment) and demand for money are complementary, not substitutes, as there is an increase of demand for money balances for firms to self-finance investment projects.

Another way to express the “complementarity” hypothesis, (McKinnon, 1973) is by decomposing the previous demand for money relation into two functions:

$$\frac{M^D}{P} = L\left(\bar{Y}, \bar{r}, d - \pi^e\right) \dots\dots\dots (2)$$

with all partial first derivatives positive, and

$$\frac{I}{Y} = F\left(\bar{r}, d - \pi^e\right) \dots\dots\dots (3)$$

with $\frac{\partial F}{\partial \bar{r}} > 0$ and $\frac{\partial F}{\partial (d - \pi^e)}$ positive or negative. If \bar{r} is an average return to

capital then $\frac{\partial F}{\partial \bar{r}} > 0$ and $\frac{\partial L}{\partial \bar{r}} > 0$ reflect the complementarity hypothesis as an

increase in demand for money because of the rise in the average return to capital and hence of the rise in $\frac{I}{Y}$ that is, in investment demand. However,

since “complementarity works both ways” (McKinnon, 1973) there is also the

effect $\frac{\partial F}{\partial (d - \pi^e)} > 0$, that is an increase in $\frac{I}{Y}$ because of the rise in the real

deposit rate. This effect will dominate over the $\frac{\partial F}{\partial(d - \pi^e)} < 0$ as far as the underdevelopment of the financial system in LDCs does not permit firms to have adequate access to external resources so as money to become an alternative rather than a complementary to physical capital assets.

Shaw's (1973) "debt-intermediation view" on the other hand, based on Goldsmith's (1969) observation concerning the effect of financial development on output growth, gives greater emphasis on the role of financial institutions and financial deepening to improve the allocation of credit by unifying a fragmented capital market in less developed economies and diminishing uncertainty concerning the future rates of return on both real and financial assets. In this sense, inside money becomes important in a model where there is a positive relationship between financial intermediation and incentives to save on the one hand and quality of investment on the other hand. The functions of financial intermediaries that include risk diversification, economies of scale in lending activities and lower transaction costs, are themselves growth promoting. Hence, the whole discussion revolves around the adverse (favourable) effects of financial repression (liberalization) on the intermediation of financial system between savers and borrowers and not around self-financing projects that McKinnon's complementarity hypothesis entails.

These assertions are reflected in Shaw's demand for money function (Shaw, 1973) that takes the form

$$\frac{M}{P} = L(Y, r_c, r, d_n, r_m, t) \dots \dots \dots (4)$$

Here, r_c represents the consumer rate of time preference, r is the rate of return on physical wealth and government debt, d_n is the rate of return on non-monetary financial assets and $r_m = u + d - \pi^e$ is the own rate of return on money – with u being money's yield of services to its holder. However, the most important argument in this formulation is a variable called t by Shaw (1973) that indicated the positive effect on demand for money caused by financial deepening developments such as technological improvements in the money industry, increased monetization of the economy etc.

However, despite the above differences, according to Molho (1986), McKinnon (1973) and Shaw (1973) views can be seen as complementary to the point that McKinnon stresses the positive effect of increasing deposits to self-financing projects and Shaw the corresponding positive effect to increasing lending by the banks—along with the efficiency considerations.

Extensions of the McKinnon-Shaw approach by Kapur (1976), Galbis (1977), Mathieson (1980), and Fry (1988) enhance little to the underlying ideas but rather formalize the McKinnon-Shaw models. Kapur and Mathieson limit the analysis by assuming the constancy of investment efficiency following financial liberalization while Galbis and Fry consider the case when efficiency increases (Balassa, 1989).

In Kapur's model, increases in the deposit rate of interest raise real money demand and hence the real supply of bank credit, resulting in an acceleration of economic growth. Similar conclusions are reached in Mathieson's model, which differs from Kapur's largely by assuming that fixed capital is fully utilized while it was assumed to be under-utilized by Kapur.

Galbis constructs a two sector model to analyze the effects of financial repression on the average efficiency of investment. In this model, financial liberalization will lead to higher efficiency by shifting savings from self-investment to uses with higher rates of return. Fry also puts emphasis on increases in investment efficiency following financial liberalization.

2.3.2 Neo-Structuralist Model

The beginnings of the 1980s witnessed the emergence of a new class of economists who differed from the earlier thoughts of McKinnon and Shaw. Van Wijnberger (1982) and Taylor (1983) were the early champions of these new ideas, now recognized as the Neo-Structural school of thought. According to the neo-structuralists, the McKinnon and Shaw Thesis has traditionally given little attention to the existence of unorganized money markets (hereinafter referred as kerb markets) in developing countries, where a significant proportion of rural people are outside of the formal banking system (Ghatark, 1975). In formalized financial markets in the developing countries, only the few rich borrowers have access to their services, as the poor borrowers cannot meet collateral and other formal requirements. Therefore, in such economies, majority of the small and medium scale businesses rely solely on the unorganized money markets for loanable funds.

According to the neo-structuralists, poor borrowers can obtain loanable funds from the kerb markets with significantly less difficulty and thus use kerb markets as their main source of funds. The kerb markets are also lucrative to the lenders because the interests they charge on loans are usually higher than those charged by the formal financial institutions. This means that in

developing economies, kerb markets act as substitute for formal financial institutions. Large volumes of transactions, therefore, are realized in the kerb markets in these economies (van Wijnberger, 1982, and Taylor, 1983).

The neo-structuralists argued along key assumptions on how wages, inflation, savings and importation needs are determined in developing economies. An implication that can be drawn from these assumptions is that the acceleration in the inflation rates alongside growth reduction—stagflation—can be initiated by tight monetary policies that raise the interest rate, the devaluation that inflates prices of import (Fry, 1988).

Another key feature of the neo-structuralists argument is the assumption of efficient kerb markets. Whilst they emphasized the existence of efficient kerb markets, they draw inspirations from the Keynesian transmission mechanisms in which demand and supply in the goods market determine the equilibrium income much in the same way as the demand and supply of money and credit determine the equilibrium market clearing interest rate in the kerb markets.

Neo-structuralists argued that non-institutional lenders supply loanable funds to small and medium scale borrowers in the rural areas of developing economies. However, the interest rates charged on such loans are so high. These high interest rates are linked to a shortage of financial saving, at least partially due to the fact that a substantial proportion of the saving in the rural or peasant sector in many such countries takes the form of the hoarding of gold and jewellery. Thus, there is a pressing need for establishing more efficient financial intermediaries which can offer attractive financial products

and thereby increase financial saving and hence bring about a reduction in interest rates (Myint, 1984).

In other works of the neo-structuralists, particularly in the seminal papers released by van Wijnberger (1982) and Taylor (1983), formal financial institutions are prone to mandatory reserve requirements. This, unlike the kerb markets limit the level of intermediation they can undertake. Kerb markets, traditionally, are more efficient since there is full intermediation between savers and investors. They noted that if kerb markets shift into time deposits as a result of higher interest rates, total supply of credit to the business sector would decline as banks provide only partial intermediation. Therefore if kerb markets are introduced to the McKinnon-Shaw Model, liberalization of interest rates rather than increasing output and growth, leads to a decline in these aggregates.

Fry (1997), he argued that the neo-structuralists models were developed from Tobin's Portfolio framework. Thus unlike McKinnon-Shaw models, which specified two assets; gold and bank deposits as making up the portfolios of households asset, the neo-structuralists models added kerb markets loans as a third form of asset. The implied meaning is that McKinnon-Shaw models swap was from gold into bank deposits in response to higher deposits rates. In the neo-structuralists models, however, whether or not supply of credit increases depended on whether the swap into bank deposits is from gold or kerb market loans.

Van Wijnberger (1982) and Taylor (1983) asserted that since formal financial institutions were less efficient in intermediation because of the existence of

mandatory reserve requirements, a swap from kerb market loans to bank deposits would have likely reduced the rate of economic under financial liberalization. Increase in deposit rates will result in a rise in the demand for bank deposits, while reducing the demand for gold and kerb market loans, since increase in deposit rates causes kerb market interest rates to rise as well. In that case, if bank deposits for kerb market loans swap is stronger than bank deposits for gold swap, the supply of loanable funds falls with the kerb market interest rates. Buffie (1984) succinctly asserts that “financial liberalization becomes a perilous undertaking”. Gupta (2004) claims that while interest rate deregulation reduces the steady-state stock of capital; reductions in the reserve requirements tend to enhance it. He recommends that financial liberalisation policies should be oriented more towards a reduction in reserve requirements than interest rate deregulation.

Neo-structuralists acknowledged that if households move out of inflation hedges and currency into time deposits, there would be an increase in the supply of loanable funds to the business sector and a fall in the informal sector interest rates. In this case, economic growth would ensue. However, if the movement is from kerb market financial assets into bank deposits, this would only lead to an increased reserves accumulation by the banking system, with an eventual decline in economic activity.

2.3.3 Endogenous Growth Models

Earlier growth theories had either neglected or treated financial intermediation in simple deterministic terms. This approach is not different from the approach

utilized in first-generation financial repression models. In the last few years, second-generation financial growth models that took into account endogenous growth and endogenous financial institutions have come out. Fry (1995) noted that various techniques, such as externalities and quality ladders, are used to model endogenous growth. It is known, however, that the specific cause of endogenous growth has no effect on the role of finance. Viewed in this way, researchers have options to choose alternative financial models for use with alternative endogenous or even non-endogenous growth models.

Endogenous growth models focus on the relationship between financial development and long-run economic growth, emphasising that productivity growth is most likely to be the channel of transmission from financial development to economic growth. A key proposition of endogenous models is that long term positive growth rate in output per capita must be sustained by persistent advances in technological knowledge in the form of new goods, new markets, or new processes (Aghion and Howitt, 2001). Literally, the new goods or processes are the financial intermediaries and their instruments, and the new markets refer to the role of trade. This proposition is implied in the Solow (1956) and Swan (1956) growth models in which technology is fixed and capital diminishes with increases in production. In this case, growth in output per capita eventually halts as the capacity of capital is exhausted.

However, previous studies by Bencivenga and Smith (1991) and Levine (1991) still do not identify the unique functions of different financial markets, and their effects on economic growth. There was no attempt to distinguish the roles played by different financial markets, such as banks, bond markets,

insurance companies, and stock markets in the relationship between financial markets and economic growth. In previous studies, banks and insurance companies would normally be regarded as intermediaries rather than markets; also, the role of stock markets in economic growth and the identification of the channels through which stock markets affect growth was ignored.

In a similar argument, Fry (1997) noted that formal financial institutions become relevant in a world of positive information, transaction and monitoring costs in the intermediation process. He continues that if monitoring costs are high, a simple debt instrument may dominate a more complicated state-contingent contract that resembles equity. On the contrary, if all contingencies are neglected, debt could lead to liquidation. Financial institutions can minimize the rate of default by requiring collateral or truncating the maturity of the loan.

It can be shown that financial intermediaries offer high expected returns. This is done by modelling a simple framework in which economic agents divides his or her portfolio between consumer goods or commodity money and investment in a firm (Diamond and Dybvig, 1983). The investment in a firm is illiquid because it takes time to become productive. Investment in a firm takes time to mature or become productive. Therefore, in a shorter period, the return from investing in a firm is lesser than in consumer goods. Uncertainty may force some individuals to liquidate or abandon their investments in firms after only one period. In such case, they would be worse off than had they held solely an inventory of consumer goods or currency (Bencivenga and Smith, 1991; Levine, 1993; Greenwood and Smith, 1997). We have different kinds of

investors—risk lovers, risk neutrals, and risk averters. Individuals may also be deterred from investing in a firm by productivity risk; some firms do better than others (King and Levine, 1993).

In the absence of formal financial institutions, economic agents must choose between capital and currency in order to maximize expected utility. Each agent has knowledge of the probability of each investment decision they want to undertake. It then boils down to their degree of risk aversion. Therefore, individuals with less taste for risk usually will invest more in currency than those with less risk aversion. Any productive investment bears some risk of becoming worthless.

Bencivenga and Smith (1991), Greenwood and Smith (1997), and Levine (1993) entrenched the Diamond-Dybvig financial intermediation model in an overlapping-generations model with production and capital accumulation. With the introduction of banks, individuals can hold deposits which banks then invest in currency and capital. By exploiting the law of large numbers, banks ensure that they never have to liquidate capital prematurely. Banks also rely on the law of large numbers to estimate deposit withdrawals which are unpredictable individually but predictable for the economy as a whole. Hence, banks avoid the uncertainty which leads to resource misallocation by individuals. By ensuring that capital is never wasted, financial intermediation may produce higher capital-labour ratios and higher rates of economic growth. By engaging in maturity transformation, financial institutions offer liquidity to savers and, at the same time, longer-term funds to investors. In so doing, they stimulate productive investment by persuading savers to switch from unproductive investment in tangible assets to productive investment in firms.

Those who do not use the Diamond-Dybvig model of financial intermediation posit other ways in which banks can stimulate endogenous growth. The difference in the rates of return on liquid and illiquid assets opens up an opportunity for profits through arbitrage. In a simple arbitrage model developed by Freeman (1985), it was demonstrated that fiat money has a higher rate of return in the short term than capital asset; capital on the other hand, has a higher rate of return in the long term than fiat money. Hence capital is a long term asset while fiat money is a short term asset. The distinction motivates the existence of financial intermediaries—they make their profits through rate of return differences in assets. This profit is the so-called arbitrage. In other words, financial intermediaries are able to source money at lower interest and lend at a higher interest (Champ and Freeman, 2001). In this simple way, the act of arbitrage is the financial intermediation process. They accept deposits (paying interest to depositors) and invest these deposits in high earning capital with long maturity. Hence, they instantly transform maturity and risks.

In a perfectly competitive financial system, new financial intermediaries will be enticed to enter to the industry due to the arbitrage by offering higher rate of return on deposits than incumbent. As they do so, incumbents react by increasing rate of return on deposits. This continues until the rate of return on deposits equal rate of returns on capital, leaving all financial intermediaries with zero arbitrage. A fair or equilibrium rate of return is established where financial intermediaries pay the same interest on deposits as the interest they earn on loans or investments. Financial intermediaries, in this case, mobilise all saving in the economy for investment in higher earning capital; this leads

to increase in national output. For example, Greenwood and Jovanovic (1990) stress the role of financial intermediaries in pooling funds and acquiring information that enables them to allocate capital to its highest valued use, so raising the average return to capital. Specifically, Greenwood and Jovanovic (1990) allow capital to be invested in safe, low-yielding investments or risky, high-yielding investments. Risk is created by both aggregate and project-specific shocks. Individuals cannot differentiate between the two types of shock.

With large portfolio holdings, however, financial intermediaries can experiment with a small sample of high-yielding projects to determine the state of the world. With this expenditure on the collection and analysis of information, financial intermediaries determine their investment strategies in the knowledge of the current-period aggregate shock. Were a negative shock to make the high-risk investments less profitable than the low-risk investments, financial intermediaries would invest only in the low-risk projects. Provided the costs of information collection and analysis are sufficiently small, the ability to choose the appropriate set of projects in the knowledge of a given aggregate shock raises the expected return on the intermediaries' portfolios above that of individuals who must choose one or the other technology without any information about the aggregate shock.

King and Levine (1993) suggest that financial institutions play a key role in evaluating prospective entrepreneurs and financing the most promising ones: 'Better financial systems improve the probability of successful innovation and thereby accelerate economic growth' (King and Levine, 1993). Following Schumpeter (1912), they stress that 'financial institutions play an active role in

evaluating, managing, and funding the entrepreneurial activity that leads to productivity growth. Indeed, they believed that their mechanism were the channel by which finance must have its dominant effect, due to the central role of productivity growth in development' (King and Levine, 1993).

The main feature of endogenous growth models is that a broadly defined concept of the economy's capital stock does not suffer from diminishing returns; hence growth is a positive function of the investment ratio. For any endogenous growth model, growth rate comparisons can be made between economies with and without banks. Relative to the situation in the absence of banks (financial autarky); banks reduce liquid reserve holdings by the economy as a whole, and also reduce the liquidation of productive capital. Then, with an externality in production, higher equilibrium growth rates will be observed in economies with an active intermediary sector (Bencivenga and Smith, 1991).

Endogenous growth, in all these models, magnifies and prolongs the effects of financial conditions. In all these models, financial repression in the form of discriminatory taxes on financial intermediation reduces the growth rate. Financial sector taxes are equivalent to taxes on innovative activity, since they reduce the net returns that financial intermediaries gain from financing successful entrepreneurs. Whereas financial development improves overall productivity, discriminatory taxation of commercial banks, investment banks, mutual funds, and stock markets through high reserve requirements, interest and credit ceilings, directed credit programmes and inflation reduces the growth rate by impeding financial development. More generally, “financial

repression reduces the services provided by the financial system to savers, entrepreneurs, and producers; it thereby impedes innovative activity and slows economic growth” (King and Levine, 1993). Indeed, the existence of externalities implies that welfare may be improved through some public subsidy of financial intermediation.

The significant contribution of the endogenous growth theory to the current debate is its recognition of innovation in the development process. Unlike classical growth models in which technology is exogenously determined, technology or technical progress is endogenously determined in the endogenous framework (Harrison, 1996). This change in events makes room for trade openness to play a role in a country’s development. Particularly, most developing countries are now opening up the trade and financial sector to the global economy with the hope of reaping possible technological spillovers.

2.3.4 Asymmetric Information Model

Stiglitz (1994) critiques financial liberalization on the grounds that financial markets are prone to market failures. He suggests that the existence of certain governmental checks will not only make markets function well but will improve the performances of economies (Stiglitz, 1994). Specifically, Stiglitz advocated government intervention to keep interest rates below their market-equilibrium levels. In his view, if financial markets are allowed to function alone, financial institutions and intermediaries may be tempted to increase interest rates well above the market rates, thus discouraging borrowing.

An essential function of financial markets is collecting, processing and conveying information for allocating funds and monitoring their use. Costly information creates market failures. One market failure arising from costly information occurs because monitoring is a public good²⁰. If one individual conducts research to determine the solvency of a financial institution and then acts upon that information, others can benefit from copying his actions. Because information about the management and solvency of financial institutions is a public good, there is suboptimal expenditure on monitoring them. When financial institutions know that they are not adequately monitored by depositors, they have incentives to take greater risks with their deposits.

Costly information can also produce externalities. For example, when several banks fail, depositors may assume that there is an increased probability that other banks will fail. Their reaction in the form of deposit withdrawal may produce the predicted failures. Externalities can also be transmitted across markets. For example, the provision of a bank loan makes it easier for a firm to raise equity capital. The bank loan provides a signal that the firm is sound and prospective equity participants can also expect the bank to monitor the firm in which they will be investing. Naturally, financial institutions are rarely concerned about these externality effects. Hence, private interest can diverge from public interest.

Given information imperfections, Stiglitz (1994) argued that financial repression can improve the efficiency with which capital is allocated. First, lowering interest rates improves the average quality of the pool of loan applicants. Second, financial repression increases firm equity because it

²⁰ See Fry (1995, 1997) for further discussion of this issue

lowers the cost of capital. Third, financial repression could be used in conjunction with an alternative allocative mechanism such as export performance to accelerate economic growth. Fourth, directed credit programmes can encourage lending to sectors with high technological spillovers.

The importance of information imperfections and the role of government intervention in the area of prudential regulation and supervision can be accepted without accepting Stiglitz's case for financial repression. First, lowering interest rates does not necessarily increase the average efficiency of investment because lower interest rates can encourage entrepreneurs with lower-yielding projects to bid for funds (Fry, 1995). Second, financial repression may not lower the marginal cost of capital if rationing forces borrowers into the curb market. Third, using past performance as a criterion for allocating credit discriminates against new entrants and perpetuates monopoly power. Finally, directed credit programmes have invariably raised delinquency and default rates, so increasing the fragility of the financial system by forcing financial institutions to increase their risk exposure with no compensating return.

The overwhelming problem in implementing financial repression advocated by Stiglitz is that there is such a small range of real interest rates over which financial repression could be appropriate, if it is appropriate at all. Stiglitz claims that it should not reduce real deposit rates below zero. As an upper bound, real loan rates over 100% are likely to indicate distress borrowing and pathological behaviour by banks. With bank operating cost ratios in developing countries typically at least twice the level of operating cost ratios

in the OECD countries (Fry, 1995), this denotes a maximum real deposit rate of only 4-5% if banks are to stay solvent.

Stiglitz had amazing faith in government. The government, in his paper (Stiglitz, 1994), is exemplary: disciplined, knowledgeable, long-sighted, objective. To Stiglitz, government pursues economic objectives without deviating into selfish interest.

The conclusions that can be drawn from these four models are that: McKinnon and Shaw argued for the minimal role of governments in the financial systems, stating that the financial sectors should be liberalized to improve financial performance; the asymmetric information model debunked this assertion by arguing that if financial markets are allowed to function without government involvement, the problems of adverse selection and moral hazard will diminish the role of financial intermediaries; the neo-structuralists pointed out the need for policymakers to recognise the existence of informal financial markets, especially, in developing countries; the endogenous growth model then stressed the role of technological progress in long run growth. The technological progress captured financial innovations, international trade, and investment in R&D. This study pools the implications of all the models together, and in particular, build on the endogenous growth model. This allows the study to capture the role of trade openness in the finance-growth debate.

2.4 Empirical Literature on Finance, Openness, and Growth

The study now turns to the findings of various authors on the finance-openness-growth debate. The empirical works are grouped in terms of the commonalities findings, for the sake of convenience. They are presented as follows:

2.4.1 Finance-led Growth

King and Levine (1993) studied the empirical links between a range of indicators of financial development and economic growth. They presented cross-country evidence consistent with Schumpeter's view that the financial system can promote economic growth, using data on 80 countries over the 1960-1989 period and cross-country regressions. The results of this study showed that various measures of the level of financial development are strongly associated with real per capita GDP growth, the rate of physical capital accumulation, and improvements in the efficiency with which economies employ physical capital. Further, the predetermined component of financial development is robustly correlated with future rates of economic growth, physical capital accumulation, and economic efficiency improvements.

Rajan and Zingales (1998) examined whether financial development facilitates economic growth by scrutinizing one rationale for such a relationship: that financial development reduces the costs of external finance to firms. Specifically, they asked whether industrial sectors that are relatively more in need of external finance develop disproportionately faster in countries with more-developed financial markets. They found this to be true in a large sample

of countries over the 1980's. They showed that this result is unlikely to be driven by omitted variables, outliers, or reverse causality.

Jalilian and Kirkpatrick, (2002) examined the linkages between financial development, economic growth and poverty reduction. Specifically, they investigated the contribution that financial development makes to poverty reduction in low-income countries. When they Run OLS on a Panel of 147 observations covering 26 countries (18 developing and 8 developed countries), their results supported the contention that financial sector development policy can contribute to achieving the goal of poverty reduction in developing countries. Their results also showed that growth is finance-led, and therefore provided a firm basis on which to undertake more focused, micro-empirical investigation of how specific financial sector policies and programmes can be deployed as effective instruments for achieving poverty reduction in low-income countries.

Agbetsiafa (2003) applied a vector error-correction model to African data (an annual data on five financial indicators and per capita GDP as a proxy for growth for the selected countries covering the period between 1963 and 2001) in order to examine the long-run equilibrium relationship, and the causal relationship between financial development and economic development in a sample of eight SSA countries. The error-correction based Granger causality tests indicated mostly a unidirectional causality running from financial development to economic development.

Abu-Bader and Abu-Qarn, (2005) tested the causal relationship between financial development and economic growth in Egypt during the period 1960-

2001. They applied Granger causality tests using the cointegration and vector error correction methodology. Their study results significantly supported the view that financial development Granger-causes economic growth either through increasing investment efficiency or through increasing resources for investment.

Finally, Habibullah and End (2006) re-examined the causality issue on financial development and economic growth from a panel data perspectives using the system generalized method of moments (GMM) technique developed by Arellano and Bover (1995), and Blundell and Bond (1998). Focusing on developing countries in four main geography regions (Africa, Asia, Europe and Western Hemisphere), the main finding of their study revealed that although there exist evidence supporting the other views including the “demand following” as well as non-causal relation between the economic growth and the financial deepening, these supports are not as strong as the “supply leading” hypothesis.

2.4.2 Growth-driven Finance

Waqabaca, (2004) examined the relationship between financial development and growth in Fiji using time series data from 1970-2000. Using unit root and co-integration techniques within a bivariate vector auto-regressive (bVAR) framework, the results revealed a positive relationship between financial development and economic growth for Fiji with the direction of causation running predominantly from economic growth to financial development. This

outcome is consistent with results found for countries which have less sophisticated financial systems.

Odhiambo (2008) examined the dynamic causal relationship between financial depth and economic growth in Kenya by including savings as an intermitting variable—thereby creating a simple trivariate causality model. Using the cointegration and error-correction techniques, the empirical results of this study revealed that there is a distinct unidirectional causal flow from economic growth to financial development. The results also revealed that economic growth Granger causes savings, while savings drive the development of the financial sector in Kenya.

2.4.3 Feedback Causality between Finance and Economic Growth

Demetriades and Hussein (1996) conducted causality tests between financial development and real GDP using recently developed time series techniques. A total of 16 ‘not highly developed’ countries and VAR Model were used in their study. The results provided little support to the view that finance is a leading sector in the process of economic development. They found, however, considerable evidence of bi-directionality and some evidence of reverse causation. Their findings also clearly demonstrated that causality patterns vary across countries and, therefore, highlight the dangers of statistical inference based on cross-section country studies which implicitly treated different economies as homogeneous entities.

Luintel and Khan (1999) examined the long-run relationship between financial development and economic growth in a multivariate vector autoregression

(VAR) framework using 10 sample countries. Their study outlined difficulties surrounding the cross-country regressions and bivariate time series studies. The long-run financial development and output relationships are identified in a cointegrating framework through tests of over-identifying restrictions. They found bi-directional causality between financial development and economic growth in all the sample countries. They attributed their findings to: (1) analysis of a higher dimensional system, (2) A new method of identifying the long-run economic relationships, and (3) a new approach to long-run causality testing.

Al-Yousif (2002) examined the nature and direction of the relationship between financial development and economic growth using both time-series and panel data from 30 developing countries for the period 1970–1999. The empirical results strongly supported the view that financial development and economic growth are mutually causal, that is, causality is the other views presented in the literature (supply-leading, demand-leading, and no relationship) but it is not as strong as that for the bidirectional causality.

Akinboade (1998) tested the causal relationship between financial development and economic growth for the period 1976-1995 in Botswana and found that there is bidirectional causality between them.

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2.4.4 Finance and Trade Openness

Svaleryd and Vlachos (2005) looked into the relationship between the level of financial development and the pattern of industrial specialization among OECD countries. The a priori information is that due to underlying technological and organizational differences, industries differ in their need for external finance. Since services provided by the financial sector are largely immobile across countries, the pattern of industrial specialization should be influenced by the level of financial development. Among OECD countries they found a strong causal effect of the financial sector on industrial specialization. Further, the financial sector is a source of comparative advantage in a way consistent with the Heckscher-Ohlin-Vanek model.

Beck (2003) set out to verify the question: Does financial development translate into a comparative advantage in industries that use more external finance? The author uses industry-level data on firms' dependence on external finance for 36 industries and 56 countries with a period of 9 years (1980-89) to examine this question. The results from running the regressions revealed that countries with better-developed financial systems have higher export shares

and trade balances in industries that use more external finance. These results were robust to the use of alternative measures of external dependence and financial development and were not due to reverse causality or simultaneity bias.

Baltagi, Demetriades, and Law (2008) addressed the empirical question of whether trade and financial openness can help explain the recent pace in financial development, as well as its variation across countries in recent years. Utilizing annual data from developing and industrialized countries and dynamic panel estimation techniques, they provided evidence which suggests that both types of openness are statistically significant determinants of banking sector development. Their findings revealed that the marginal effects of trade (financial) openness are negatively related to the degree of financial (trade) openness, indicating that relatively closed economies stand to benefit most from opening up their trade and/or capital accounts. Although these economies may be able to accomplish more by taking steps to open *both* their trade and capital accounts, opening up one without the other could still generate gains in terms of banking sector development.

Last, Asongu (2009) analysed the linkages between openness and financial intermediary development when income levels matter, using a panel of 29 African middle and low income countries with data spanning from 1988 to 2007. Main findings were four: firstly, openness in the last two decades has not been the effect of growth and welfare, but of structural adjustment policies imposed by the IMF and World Bank; secondly, but for the positive impact of trade openness on the financial depth of low income countries, openness in

sampled countries fail to bring about financial intermediary development; thirdly, financial openness brings trade openness for both income levels, but the reverse is true only for middle income countries; lastly, low income countries will benefit more from trade openness through financial deepening and financial openness than their middle income counterparts.

2.4.5 Trade and Economic Growth

Yanikkaya (2002) investigated the relationship between financial openness and economic growth using a panel of over 100 developed and developing countries observed from 1970 to 1997. Running a cross-country regression on this data, the paper demonstrated that trade liberalization does not have a simple and straightforward relationship with growth using a large number of openness measures for a cross section of countries over the last three decades. The regression results for numerous trade intensity ratios were mostly consistent with the existing literature. However, contrary to the conventional view on the growth effects of trade barriers, their estimation results showed that trade barriers are positively and, in most specifications, significantly associated with growth, especially for developing countries and they are consistent with the findings of theoretical growth and development literature.

In another development, Onafowora and Owoye (1998) conduct a study on how trade liberalisation stimulates economic growth in Africa. Their study examined changes in economic growth that are likely to result from changes in trade policies, exports, and investment in 12 sub-Saharan African (SSA) countries. Using a vector error correction model (VECM), cross-country

specific approach and an augmented production function, their results indicate that trade policies, exports, and investment rate shocks have a significant impact on economic growth in 10 of the 12 SSA countries. This suggests that it is possible to stimulate economic growth in some African countries through an outward-looking strategy of export expansion. More significantly, the results further suggested the importance as well as the need for African countries to embark on trade liberalization policies in order to enhance economic growth in the current world economy.

2.4.6 Finance-Openness links and Growth

Harrison (1996) drew a variety of openness measures to test the association between and growth. The results showed that there was generally a positive association between growth and different measures of openness. The strength of association depends on whether the specification uses cross-section or panel data. The study also revealed a positive relationship between openness and financial development.

Similarly, Edwards (1998) used a new comparative data set for 93 (a panel data for 1960-1990) advanced countries to analyze the robustness of the relationship between openness and Total Factor Productivity growth. The regressions results are robust to the use of openness indicator, estimation technique, time period and functional form and suggested that more open countries have experienced faster productivity growth.

Table 2.1: Summarizes Empirical Studies on the Finance-Openness-Growth Debate

Group	Author	Data	Estimation Technique	Direction of Causality
Finance-led Growth	King and Levine (1993)	Data on 80 countries over the 1960-1989 period	Cross-country regressions.	Finance causes growth
	Rajan and Zingales (1998)	Panel Data	Basic regressions	Finance causes growth
	Jalilian and Kirkpatrick (2002)	Panel Data	OLS	Financial causes growth
Growth-driven Finance	Waqabaca (2004)	Time Series Data	bVAR	Growth causes finance
	Odhiambo (2008)	Times series data on Kenya from 1991 to 2005	tVAR	Growth causes finance
Feedback	Demetriades and Hussein (1996)	Time Series	VAR Model	Bidirectional causality between finance and growth
	Luintel and Khan (1999)	Panel Data	MVAR framework	Bidirectional causality between finance and growth
	Al-Yousif (2002)	Time-series and Panel data	ECM	Bidirectional causality between finance and growth
Finance and openness	Svaleryd and Vlachos (2005)	Panel Data	Cross-country regressions	Finance causes openness

Source: Author's Design from Empirical Literature

Table 2.1 Summarises Empirical Studies on the Finance-Openness-Growth Debate

Group	Author	Data	Estimation Technique	Direction of Causality
Finance and Openness	Beck (2003)	36 industries and 56 countries	OLS	Countries with better-developed financial systems have higher export shares
Trade and Growth	Yanikkaya (2002)	Panel of over 100 developed and developing countries	Cross-country regression	Trade causes economic growth, especially in developing countries.
	Onafowora and Owoye (1998)	12 sub-Saharan African (SSA) countries	vector error correction model (VECM)	Outward-looking trade policies sway economic growth
Finance-openness links and economic growth	Edwards (1998)	Panel Data of 93 advanced countries	OLS	Finance through trade openness sways economic growth
	Harrison (1996)	Cross-sectional or panel data (1960-1988)	Panel Models	A positive association between growth and different measures of openness that provides for further effects on finance

Source: Author's Design from Empirical Literature

2.5 Conclusion

The chapter discussed the meaning of financial deepening, trade openness, and economic growth. It also considered the links between these variables. The dominant theories underlying the finance-openness-growth debates, namely: the McKinnon-Shaw Model, the Neo-Structural Models, the Endogenous Growth Models, and the Asymmetric Information Models were thoroughly exposed. Although the McKinnon-Shaw Model remains the most powerful model for many developing countries, the constructive criticisms levelled

against it by the alternative models cannot be taken for granted. For instance, it assumes perfect market structures and perfect information. It is now clear from the neo-structural theories that markets are not efficient, especially in developing countries. The financial markets in developing countries are dualistic in nature. From the evidence provided by the asymmetric information models, there exists imperfect information in financial markets. Financial liberalization would not necessarily improve financial sector performance because of the high likelihood of the principal-agent problem. The momentum is now shifting to the endogenous growth theory. The endogenous growth theory advocates the need for trade openness so that countries can benefit from innovation and technological spillovers.

The available empirical literature on the finance-openness-growth debates was classified in this chapter according to their findings. These findings were then summarized in Table 2.1. Just as the departure from a common consensus that was found in the theoretical literature, the empirical works could not produce a unique conclusion. The first group of authors found that growth is finance-led; the second group found that finance is growth-driven and the last group identified a feedback effect between finance and growth. The chapter concluded by examining empirical works that considered the impact of trade openness on the finance-growth nexus. The evidence shown in Table 2.1 confirmed that trade openness is crucial in the finance-growth linkage. These interesting conclusions provide the impetus for the next chapter.

CHAPTER THREE

OVERVIEW

3.1 Introduction

This chapter provides the foundation on which the remaining chapters are built. It consigns the study to an appropriate regional economic setting— which is West Africa. The chapter is presented in four sections. The first section briefly exposes the two main economic and regional grouping in West Africa, namely West African Monetary Zone (WAMZ) and West African Economic and Monetary Union (WAEMU). The second section, which briefly talks about the history of WAMZ, is divided into three subsections. The first, second and third subsections of section two provide analysis to trends in financial development, trade openness and economic growth in the WAMZ, respectively. The third section, which provides a brief history of WAEMU, is also divided into three subsections. The first, second and third subsections of the third section provide analysis to trends in the financial development, trade openness and economic growth in the WAEMU, respectively. The final section summarizes the whole chapter.

3.2 Trends in Financial Development, Trade Openness and Economic Growth in West Africa

3.2.1 Economic and Regional Grouping

West Africa is geographically made-up of fifteen countries. Out of the fifteen countries, we have two regional economic groupings; these are the West African Monetary Zone (WAMZ) and the West African Economic and

Monetary Union (WAEMU). The members of WAMZ are: Sierra Leone, Gambia, Guinea, Ghana, Liberia, and Nigeria. The members of WAEMU are: Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo. Mauritania does not belong to any of these groups; therefore, they have been overlooked for this study. Due to irregularities in the country data for Liberia and Guinea, they have been excluded from this study; the remaining number of countries used in this study is twelve.

3.2.2 Brief History of West African Monetary Zone (WAMZ)

The Treaty establishing the West African Monetary Zone (WAMZ) was adopted in December 1999 by Heads of States of ECOWAS at the Lomé Summit, in Togo. WAMZ was finally established in 2000 comprising The Gambia, Ghana, Guinea, Nigeria and Sierra Leone. The objectives of its creation are: securing monetary union between the five member states, instituting a regional central bank, creating a single financial services supervisor, and building a common market for goods and services (WAMI Report, 2012).

The development of monetary union and, also, the willingness of member states to facilitate progress towards a common market in financial services by harmonizing legal and regulatory frameworks, are clearly hampered by the diverse nature of WAMZ. For example, the WAMZ banking market is dominated by Ghana and Nigeria with the combined banking systems of The Gambia, Guinea, and Sierra Leone amounting to only 0.37% of WAMZ's total banking assets, 0.45% of WAMZ's total deposits and short term funding, and 0.29% of WAMZ's total loans. The launching of the single monetary union

has been postponed three times (2008, 2010, and 2012) due to the poor nature of macroeconomic convergence. According to WAMI, the common currency, also known as the Eco, is expected to be launched in 2015.

Table 3.1: Selected Economic Indicators of some WAMZ countries (2000—2011)

	The Gambia		Ghana		Nigeria	
	DCG	GDP	DCG	GDP	DCG	GDP
2000	6.74	5.53	13.97	4.19	12.46	5.32
2001	11.35	5.75	11.88	4.50	15.24	8.16
2002	10.69	-3.25	12.15	4.65	13.04	21.18
2003	11.76	6.87	12.49	5.11	13.82	10.34
2004	8.36	7.05	13.17	5.32	13.14	10.59
2005	9.64	-0.34	15.54	6.02	13.24	5.39
2006	11.61	0.80	11.09	6.12	13.18	6.21
2007	12.09	3.96	14.49	6.46	25.33	6.97
2008	14.12	6.45	15.88	8.43	33.91	5.98
2009	14.76	6.68	15.66	3.99	38.59	6.96
2010	15.39	5.51	15.29	8.09	24.93	7.98
2011	16.33	3.26	15.19	14.39	21.09	7.36

a. DCG is Domestic Credit to Gross Domestic Product

b. GDP is Growth rate of Real Gross Domestic Product

Source: Author's design from WDI (2012)

3.2.2.1 Financial Systems of Selected WAMZ Countries

The capital markets of WAMZ countries are undeveloped. The stock prices are regulated. In the Ghana Stock Exchange (GSE) and the Nigeria Stock Exchange (NSE), for instance, stock prices are only legally allowed to fluctuate by 5% per trading day. This means that on these exchanges, stock prices cannot rise or fall by 5% of their previous level; only false trading can lead to prices increasing or falling by 5% overnight. NSE and GSE do not have any kind of trading or listing relationship. As at 2009, the Ashanti Goldfields accounted for 90% of the total capitalization of the Ghana stock market which is not a good thing. Guinea and The Gambia are also on course

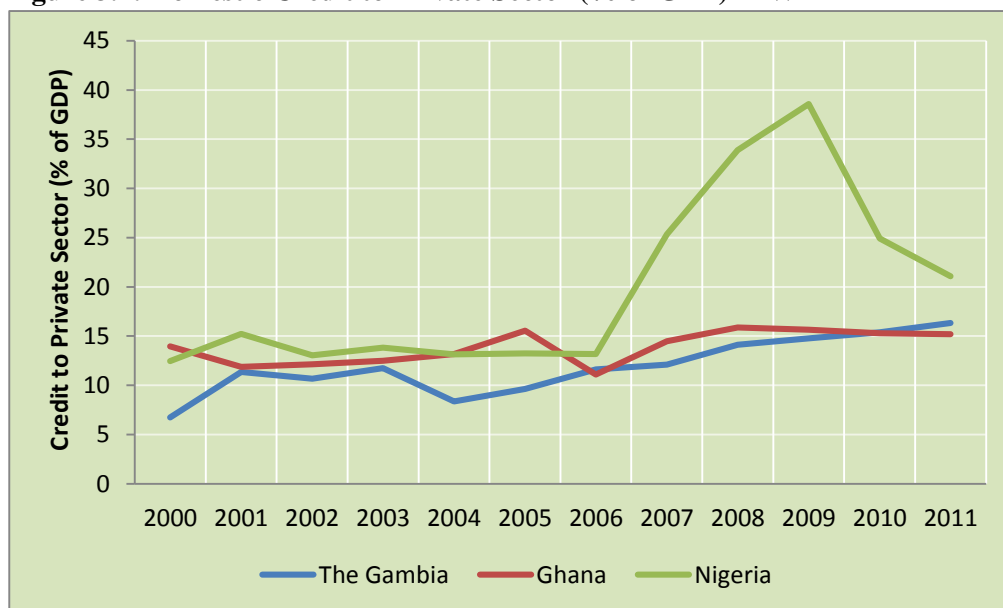
to establishing stock exchanges—albeit both are still at the preparatory stage. Sierra Leone Stock Exchange (SLSE) commenced trading in 2009 with one company listed as at 2013.

In contrast to WAEMU, WAMZ has no common currency; hence central banks of member countries regulate and supervise the activities of commercial banks and financial institutions. In Nigeria, for instance, the Central Bank of Nigeria undertakes all monetary policies with the principal aim of maintain low and stable rate of inflation. The Gambia has thirteen (13) commercial banks and almost all of them are predominantly owned by foreign financial institutions. It also has one-hundred and twenty (120) microfinance institutions, forty-nine (49) registered forex bureaux and eleven (11) insurance companies. Sierra Leone has twelve (12) commercial banks, nine (9) community banks, fifty-one (51) forex bureaux, nine (9) insurance companies and two (2) discount houses. In Ghana, the financial sector is made up of twenty-seven (27) commercial banks, one-hundred and thirty-three (133) rural banks, two-hundred and fifteen (215) microfinance institutions and twenty (20) insurance companies. The Nigerian financial system (considered more developed relative to developing economies) consists of twenty-four (24) commercial banks, one-hundred and sixty-one (161) microfinance institutions and forty-eight (48) insurance companies. All these information are correct in 2013 terms.

The domestic credit to private sector as a percentage of GDP in the WAMZ has not been encouraging, averaging around 11.2% between 2000 and 2005. Beyond 2005, only Nigeria showed real upward movement, improving from 13.2% in 2005 to an eye-watering 40% in 2009 and then declining to 21.1% in

2011. This was possible in the case of Nigeria because it has the third best capital market in SSA. Ghana, Sierra Leone and The Gambia averaged 13.4% between 2005 and 2011. Due to the undeveloped nature of the capital markets in Ghana, Sierra Leone and The Gambia, investment in government bonds and treasury bills are considered safer than investing in the private sector. But as these economies gear towards catching up the rest of the world, invest in the private sector would surely increase; the private sector is now viewed as the main vehicle for driving growth. Figure 3.1 shows the movements in domestic credit to private sector as percentage of GDP between 2000 and 2011.

Figure 3.1: Domestic Credit to Private Sector (% of GDP) in WAMZ



Source: World Development Indicators, 2012

3.2.2.2 Trade in Selected WAMZ Countries

According to IMF, “exports of goods and services comprise all transactions between residents of a country and the rest of the world involving a change of ownership from residents to non-residents of general merchandise, goods sent

for processing and repairs, nonmonetary gold, and services”. Imports of goods and services is the exact opposite of the above definition.

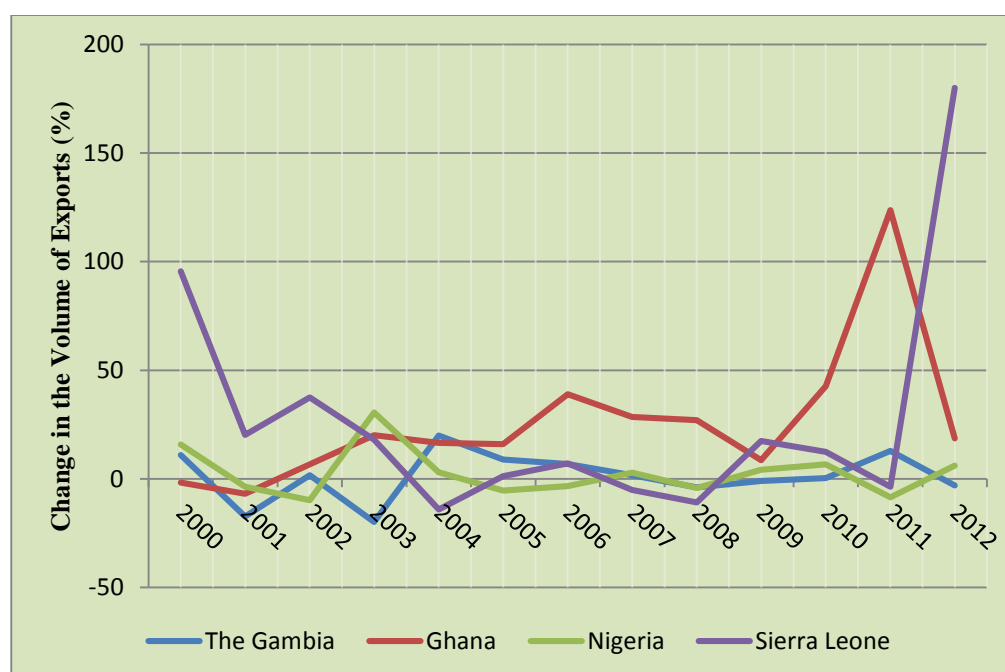
Historically, trade in the region has mainly been dominated by imports of goods and services. Raw agricultural goods, crude minerals, and tourism account for exports of goods and services in the region over the years. In the export sector, Gambia, Ghana and Nigeria suffered from declining exports of goods and services between 2000 and 2001. Sierra Leone was a notable exception (although it suffered from a massive decline in percentage change in exports from 95.5% in 2000 to 20.1% in 2001). Basically, all three countries recorded negative percentage change in exports of goods and services between 2000 and 2001. Beyond 2001, only Ghana enjoyed positive changes in exports of goods and services. We must add that the strong performance of Ghana’s export sector was boosted by the discovery of crude oil in June 2007, the stable world prices of gold and cocoa, and the increase in the contribution of the tourism over the 2008—2011 period.

The Gambia, Nigeria and Sierra Leone produce mixed trends in the percentage change in exports of goods and services between 2001 and 2012. Remarkably, the percentage change in exports of goods and services in Ghana drop drastically from a record high of 123.8% in 2011 to 18.6% in 2012. Sierra Leone, on the contrary, enjoy a change in fortune between 2011 and 2012—the percentage change in exports of goods and services increased rapidly from a low of -3.7% in 2011 to a high of 180.1% in 2012.

On a whole, The Gambia and Nigeria did not show any important signs of promise performance in the export sector. Nigeria only showed an

improvement in percentage change in exports between 2002 and 2003; The Gambia also indicated a short-lived improvement between 2003 and 2004, and that was about it. Given Nigeria's massive stock of crude oil, the percentage change in exports is rather strange. Figure 3.2 depicts the trends in percentage change in exports of goods and services among countries in the West African Monetary Zone.

Figure 3.2: Change in Volume of Exports (%) in WAMZ

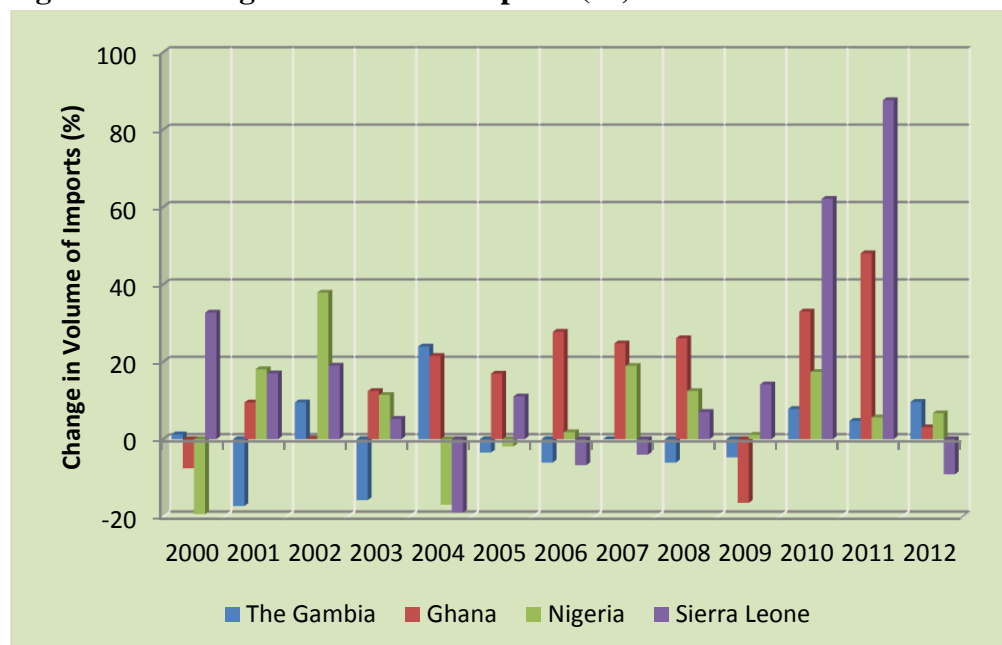


Source: IMF, World Economic Outlook Database, October 2012

Countries in WAMZ continue to import goods and services from other regions to supplement its supply shortages. Barring occasional negative percentage changes in imports of goods and services in the WAMZ region, imports has soared between 2010 and 2011. Sierra Leone has been the leader of imports of goods and services for the 2010 and 2011 period, recording percentage change in imports of 62.2% and 87.6% respectively; closely followed by Ghana, which recorded 33.0% and 48.1%, respectively in 2010 and 2011. The

percentage change in imports of goods and services was particularly positive and consistent in Ghana except for 2000 and 2009 where the country recorded percentage changes of -7.5% and -16.4% respectively. In Ghana's case, this was to be expected since most new governments in developing countries undertake austerity measures to reduce soaring government debts left behind by previous governments. Nigeria followed Ghana in terms of positive figures recorded for change in imports. It recorded negative percentage changes imports of goods and services in only 2000, 2004 and 2005 (-19.4%, -16.9%, and -1.9%, respectively). The Gambia recorded the worst percentage changes in imports. Figure 3.3 provides a graphical impression of the percentage change in the imports of goods and services among countries in WAMZ.

Figure 3.3: Change in Volume of Imports (%) in WAMZ



Source: IMF, World Economic Outlook Database, October 2012

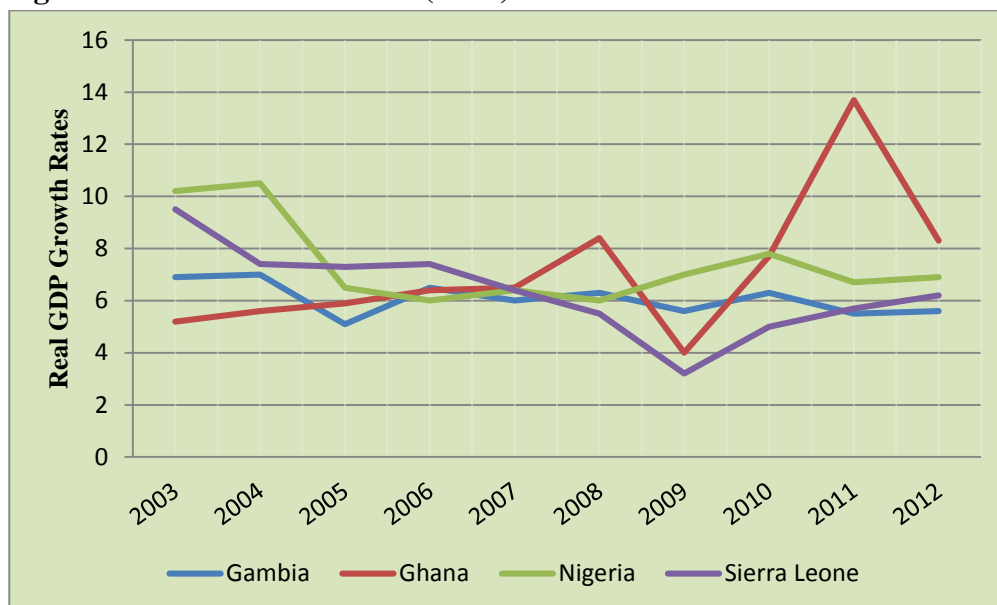
3.2.2.3 GDP Growth in Selected WAMZ Countries

On the average, financial depth in WAMZ region has shown a significant improvement since the early 2000s, so did the trend in economic growth. The

Gambia, Ghana, Nigeria and Sierra Leone have all maintained consistent positive real GDP growth over the entire 2000—2012 period. The main factor that accounted for this positive real GDP growth was the relative political and economic stability enjoyed within these countries over the eleven year period. In the exception of Nigeria, all three countries did suffer a dip in real GDP growth in 2009, with Sierra Leone and Ghana suffering the most.

These countries were slightly affected by the aftermath of the global credit crunch in 2008. From 2009 onwards, Ghana enjoyed the most rapid economic growth, clinching a historical high of 13.7% in 2011 and then declining to 8.3% in 2012. The Key driver of economic growth in Ghana over the 2009—2011 period was the oil discovery in 2007. Another notable trend was the free fall in real GDP growth of Nigeria from 10.5% in 2004 to 6.5% in 2005. The civil unrest, especially in the Delta State, triggered by the rising cost of living and unemployment was the main cause of that free fall.

Generally, The Gambia enjoyed the most consistent but moderate real GDP growth over the 2000—2012 period, revolving around 6%. This robust growth in The Gambia was propelled by good harvests and buoyant tourism seasons—prior to this, it did suffer slight decline in revenue between 1995 and 2004, due to persistent drought and fall in tourism import. Also, contractionary monetary policy employed by the Central Bank of Gambia help stabilized the Dalasi; this reinforced the moderate yet consistent real GDP growth of about 6% over the eleven year period. The analysis is based on Figure 3.4.

Figure 3.4: Real GDP Growth (in %) in the WAMZ

Source: AfDB Statistics Department, 2013

3.2.3 Brief History of West African Economic and Monetary Union

The West African Economic and Monetary Union (WAEMU) was founded in 10th January, 1994 in response to the devaluation of the common currency, the CFA Franc, on 11th January, 1994. The Treaty establishing WAEMU²¹, the Dakar Treaty of 10th January 1994, theoretically came into effect on 1st August 1994 after ratification by the seven member countries, thereby also replacing the West African Economic Union (WAEU/CEAO). In January 1995 the Commission and the Tribunal of Justice was officially implemented in Ouagadougou, Burkina Faso. The first Summit of Head of States and Government took place in May 1996. In July of the same year Guinea-Bissau became the eighth member of the community. In January 1998, the Inter-Parliamentarian Commission was created. In December 1999, member states

²¹ This is also called UEMOA in Francophone countries. WAEMU or UEMOA are often used interchangeably.

adopted the Common Industrial Policy. In 2000, the community established a Common External Tariff, a Common Mineral Policy, followed by the adoption of the Agricultural Policy of the Union and Common Energy Policy in the following year. In 2003, the Parliament of UEMOA was created.

Table 3.2: Selected Economic Indicators of some WAEMU Countries

	Benin		Burkina Faso		Cote d'Ivoire		Mali	
	DCG	GDP	DCG	GDP	DCG	GDP	DCG	GDP
2000	12.09	4.86	11.72	2.93	15.50	-4.63	16.50	-3.28
2001	11.09	6.20	12.05	6.61	15.70	0.019	17.82	11.86
2002	11.36	4.44	13.04	4.35	15.10	-1.57	17.66	4.31
2003	14.21	3.95	13.70	7.81	13.62	-1.68	19.04	7.62
2004	14.59	3.08	14.11	4.48	14.35	1.58	20.02	2.27
2005	16.59	2.87	16.46	8.67	13.78	1.90	17.23	6.14
2006	16.80	3.75	17.71	6.25	14.21	0.73	18.75	5.25
2007	19.56	4.63	16.85	4.10	16.15	1.59	18.05	4.30
2008	20.86	5.02	17.71	5.81	16.25	2.33	17.15	4.98
2009	22.47	2.66	17.02	2.96	17.32	3.75	17.50	4.46
2010	23.33	2.55	17.60	7.89	18.01	2.39	18.06	5.82
2011	24.55	3.53	19.77	4.16	18.06	-4.73	21.00	2.73

a) DCG is Domestic Credit to Gross Domestic Product

b) GDP is Growth rate of Real Gross Domestic Product

Source: Author's design from WDI (2012)

3.2.3.1 Financial Systems of Selected WAEMU Countries

As a requirement for concessionary loan disbursement to many of the cash-strapped developing countries, IMF instructed these countries to reform their financial systems. WAEMU countries benefitted a lot from the systemic reforms. The number of commercial banks has increased over the years in these countries; so did the number of financial institutions and intermediaries. The WAEMU banking system is concentrated, with 19 large banks holding the major market share of 62.7%; 24 are of medium size and hold 27.6% market share while the remaining 9.7% market share is held by 27 small banks (Allen

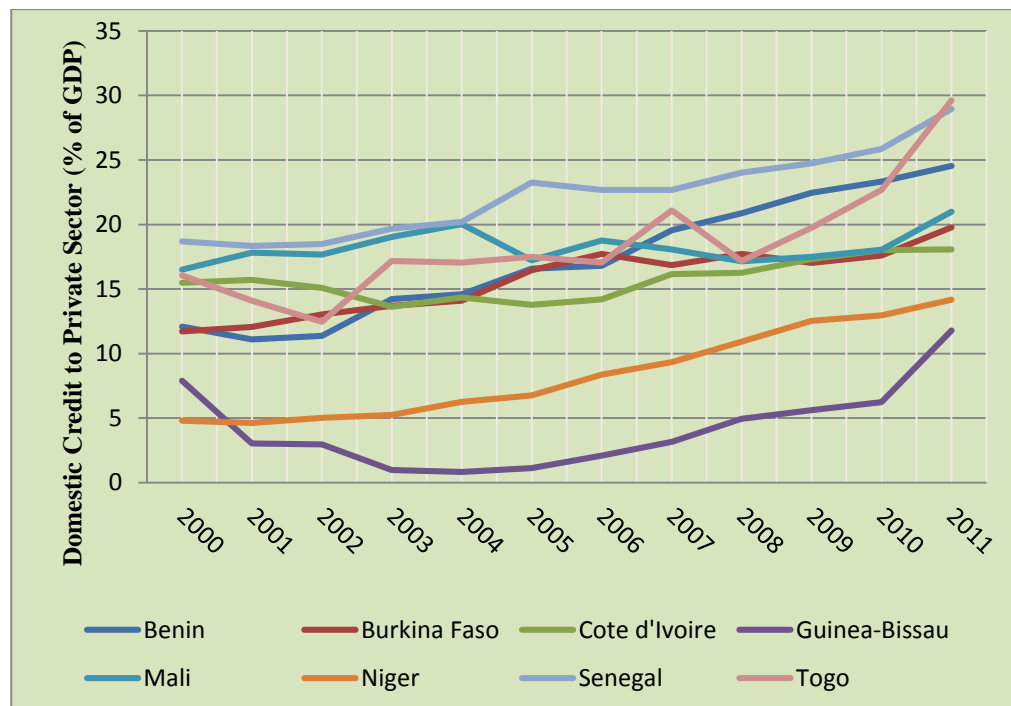
et al, 2009). The financial soundness indicators available suggest that the banking system of WAEMU is largely healthy (IMF, WAEMU Staff Report, 2012). The IMF assessment indicates that at end-2010, the WAEMU banks were on average well capitalized, with a risk-weighted capital adequacy ratio of 13%. Nonperforming loans (NPLs) stood at a high level (17%) and reflect to some extent legacy issues and the reluctance of banks to write down assets out of concern it could affect recovery prospects. However, the rate of provisioning is relatively high (65%).

The ratio of broad money to GDP in the WAEMU increased from 24% in 2006 to 31% in 2010. In terms of annual percentage growth, Guinea-Bissau experienced the fastest rate, followed by Côte d'Ivoire, Togo, Benin, Burkina Faso, Niger, and Senegal. The regional stock market registered modest growth during the period and remains small. Market capitalization as a share of GDP increased from 24% in 2006 to 31% in 2010, although the number of listed firms declined from 40 to 38. Liquidity in terms of the value of stocks traded as a share of GDP remained very low compared to other stock exchanges in the SSA and decreased marginally.

A very dynamic segment of the financial sector in recent years has been the government securities market. By end-2011 annual issuances of government securities represented almost 10% of GDP. The fastest growth was observed in 2009–11, when the issuances of government securities increased six-fold, both in nominal terms and as a share of GDP and tax revenue. Despite the growth in this segment, government borrowing in the regional market is mainly short term.

Another indicator of the increase in the financial depth in the WAEMU region is the domestic credit to private sector as percentage of GDP. Basically, all eight countries (Guinea-Bissau, Niger, Benin, Togo, Côte d'Ivoire, and Senegal) have produced an upward trend in domestic credit to private sector, implying that the financial systems of these countries are undergoing rapid development. The domestic credit going to the private sector in Guinea-Bissau, however, declined between 2000 and 2004 (declining from 48.2% to 15.8%). Senegal leads the pack. The domestic credit to private sector (as a percentage of GDP) has been tremendous. Over the ten-year period (2000 to 2011), Senegal has consistently maintained domestic credit to private sector (as a percentage of GDP) of about 35.7%. This shows that the financial system of Senegal over the ten-year period has deepened. This trend is depicted in Figure 3.5.

Figure 3.5: Domestic Credit to Private Sector (% of GDP) in WAEMU



Source: World Development Indicators, 2012

Notwithstanding the deepening in 2000–2011, the financial system in the WAEMU continues to be characterized by very low levels of financial intermediation, even when compared with countries which have similar levels of GDP per capita. For instance, the ratio of broad money to GDP was 38% in 2011 in sub-Saharan Africa on average against 31% in the WAEMU. Similarly, credit to the private sector constitutes to only about 18% of GDP on average in the union (IMF, WAEMU Staff Report, 2012).

While better information is needed concerning access to financial services, in particular through regular surveys, access is known to be low, with bank accounts held by only about 5% of the population. These ratios are low even by sub-Saharan Africa standards. Transactions on the regional interbank and stock markets are limited, and there is no secondary market in government securities. Although the banking system has excess liquidity, small and medium-sized enterprises experience difficulties in access to bank loans, with financing provided mostly to a few large enterprises and governments.

3.2.3.2 Trade in Selected WAEMU Countries

In the 2000, change (%) in volume of exports of goods and services was positive in only two countries in the WAEMU region. These countries are Benin and Niger, which recorded percentage changes of 37.3 and 23.3, respectively. The worst exports sector by country in 2000 was Burkina Faso recording a percentage change in volume of exports of -27.8. Overall, 2000 was, indeed, a bad year in the WAEMU region. Beyond 2000, exports

performance was moderate for the WAEMU region, with about two or three countries enduring negative percentage change in volume of export.

In particular, over the entire eleven-year period (2000 to 2012), Cote D'Ivoire endured the most unpleasant condition in terms of exports growth. It recorded negative percentage change in volume of exports in 2000, 2001, 2003, 2007, 2008, 2010 and 2011. The main factor that accounted for this poor performance in the Ivorian exports sector and for that matter its economy was the protracted political instability. This instability spanned over a decade thereby increasing political risk and worsening foreign trade relationships (both bilateral and multilateral).

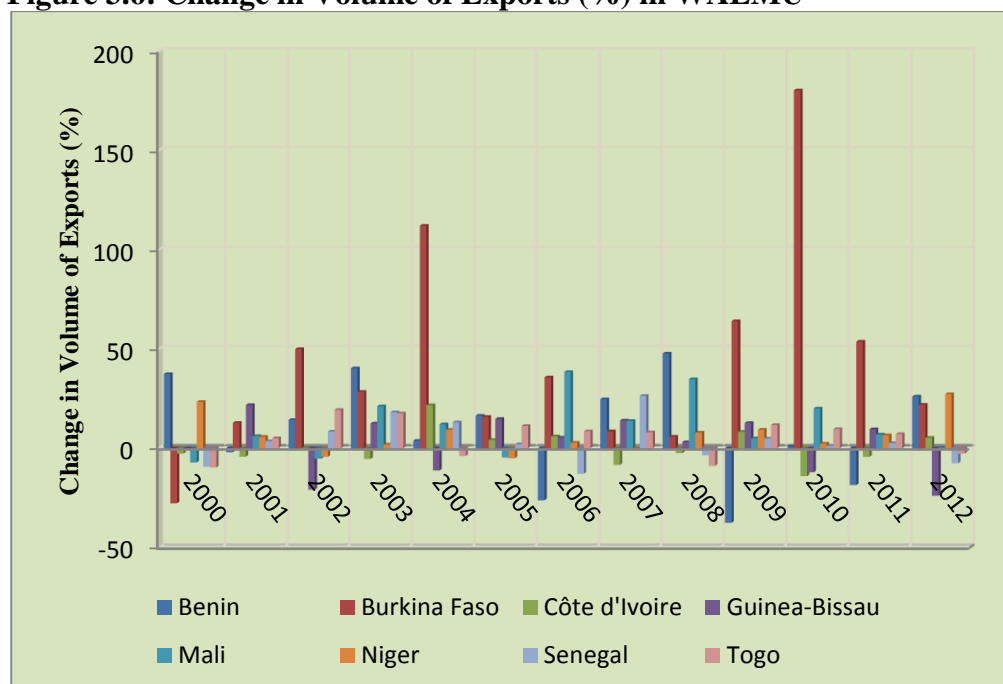
Burkina Faso performed well over this period (2000 to 2012), initially hitting a snag in 2000 and recovering thereafter. The percentage change in volume of exports enjoyed by Burkina Faso was beyond its partner countries in WAEMU for 2004 (112.1% was recorded). It surpassed this haul of a figure by clinching an astronomical 180.3% in 2010. Togo and Niger recorded few bad years and that were about it. They reaped moderate percentage changes in volume of their respective exports of goods and services. Figure 3.6 provides a better pictorial impression of our discussion.

Just as we found in the WAMZ region, WAEMU countries depend so much on imports of goods and services. In order of dependency, starting from most to least, Niger comes first, followed by Benin and Burkina Faso, Togo, Guinea-Bissau, Cote D'Ivoire and Senegal, and Mali rounding the list. Over the entire eleven-year period (2000 to 2012), only Mali imported less. Notably, Mali recorded negative percentage change in volume of imports of

goods and services for six years. These were 2000, 2002, 2004, 2009, 2011, and 2012 (rates of -2.0%, -10.6%, -1.6%, -17.6%, -2.9% and -7.1%, respectively). These imports reductions were not due to policy prescription but were due to the fact that Mali remains one of the poorest nations in sub-Saharan Africa; besides, it frequently suffered from rebel activities.

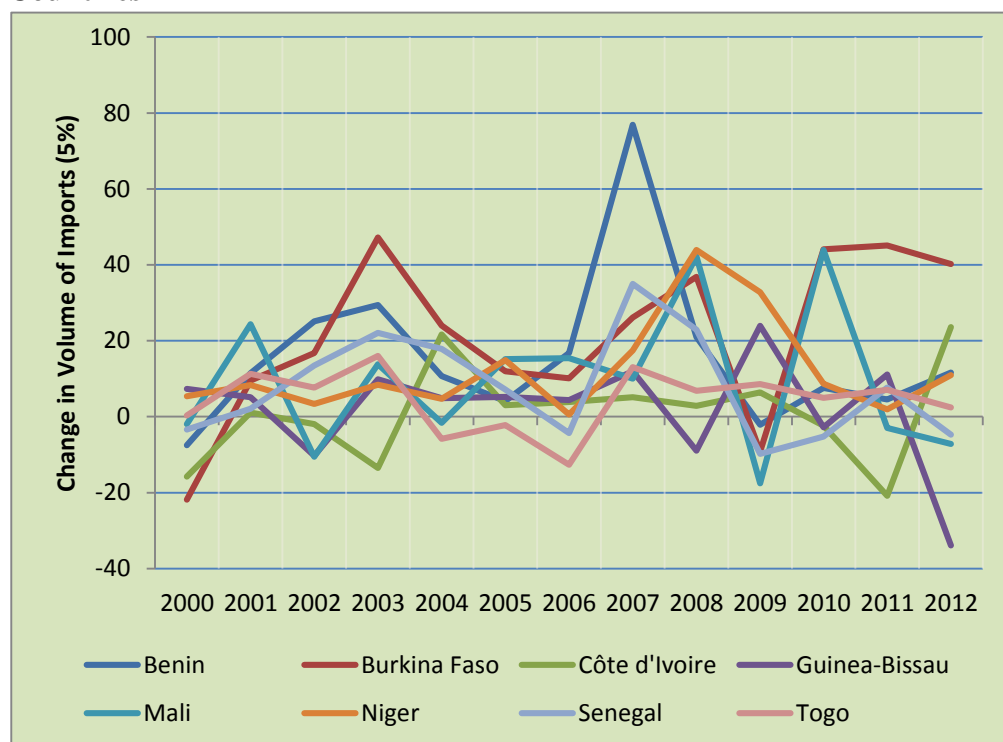
Over the entire period, the two striking moments were 2007, when Benin almost imported twice the previous year (76.9% more), and 2012, when Guinea-Bissau imported less than about half the previous year's imports (33.9% less). Niger imported goods and services every year over the entire period (from 2000 to 2012). This was to be expected as Niger is located in an arid region which barely supports food production and the formation of valuable natural resources. Detail trends of the percentage change in volume of imports of goods and services can be followed in Figure 3.7.

Figure 3.6: Change in Volume of Exports (%) in WAEMU



Source: IMF, World Economic Outlook Database, October 2012

Figure 3.7: Change in Volume of Imports (%) in Some WAEMU Countries



Source: IMF, World Economic Outlook Database, October 2012

3.2.3.3 GDP Growth in Selected WAEMU Countries

The trends in annual real GDP growth (in %) have been encouraging between 2003 and 2012, among the WAEMU countries—although the positive real GDP growth was often dampened by drought that affected severely cereal production, especially, in the Sahel Countries (Burkina Faso, Mali, Niger and Senegal). The estimated decline in real GDP growth due to drought ranges between 7% and 27%. These trends coincide with the rate of financial deepening among the WAEMU countries (see Figure 3.5).

Within the nine-year period (2003 to 2012), only Cote d'Ivoire (2003 and 2011), Guinea-Bissau (2003) and Niger (2004 and 2009) had particular year(s) with negative annual real GDP growth. Benin, Burkina Faso, Togo, Senegal

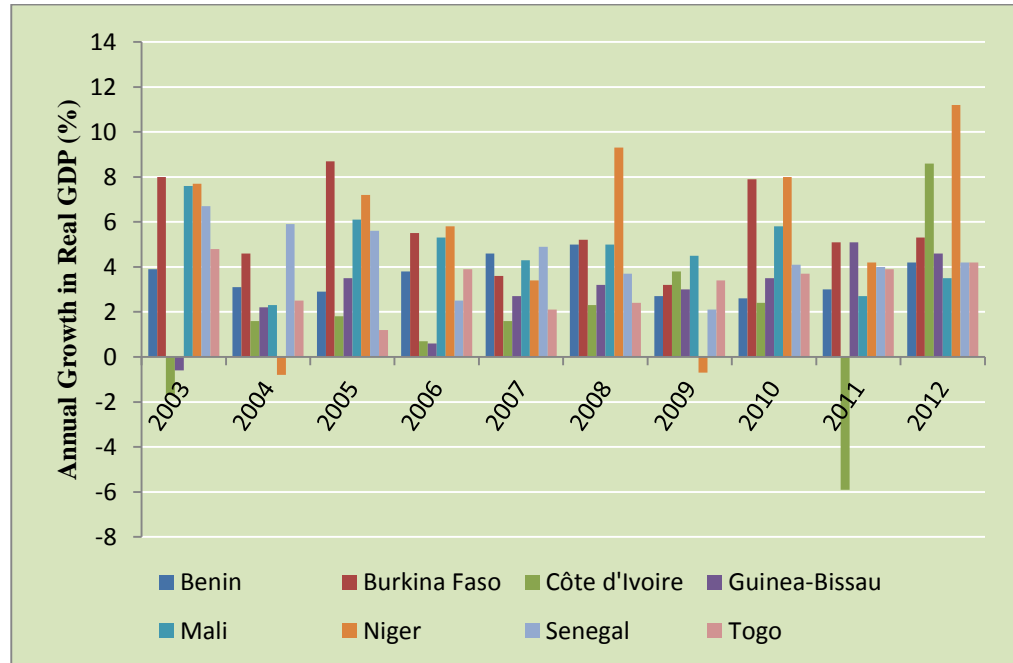
and Mali recorded positive annual real GDP growth over the nine-year period (from 2003 to 2012). The growth in the WAEMU region has been enhanced by the decision of the various heads of state to embark on an ambitious investment-led recovery. Niger recorded the highest annual real GDP growth of 11.2% and this occurred in 2012; this was mainly boosted by new oil production facilities. Cote d'Ivoire recorded the lowest growth of -5.9% and this was in 2011. The political instability in Cote d'Ivoire led to an annual GDP decline of 5.8%. Burkina Faso led the WAEMU countries in overall annual real GDP growth, closely followed by Mali, Senegal, Niger, Benin, Togo and Guinea-Bissau, in decreasing order; Cote d'Ivoire rounds the list. Figure 3.8 provides details of the trend in annual real GDP growth among these WAEMU countries.

Cote d'Ivoire's economy is reeling from the civil conflicts that rocked the country in recent years and the annual GDP growth is a manifestation to that. Senegal and Cote d'Ivoire are more open to the world economy and thus suffered from the global economic meltdown in 2008—2012 period. However, both countries are now benefiting from domestic sources of growth, spurred by increased infrastructure investment and end of frequent power outages, particularly in Senegal. WAEMU countries were task to contain the risk of a contagion from the Ivorian crisis in 2011, which they completed successfully. However, the crisis has prevented relevant progress towards regional economic integration.

In all, the global economic downturn is expected to affect WAEMU growth by 1.5%, according to IMF. Due to the fact that the financial sector of

WAEMU is domestically funded, the global financial crisis is expected to have limited impact.

Figure 3.8: Real GDP Percentage Growth in the WAEMU



Source: AfDB Statistics Department, 2013

3.3 Conclusion

The financial systems in West Africa have undergone significant transformation from state-owned to majority private-owned. This has weakened the excessive state control and credit allocation experienced in the past. There is no denying the fact that the financial systems in West Africa have deepened over the years. M2/GDP has been on the rise in most of the West African countries. What remained as obstacles are the poor nature of the capital markets and the small percentage of domestic credit to the private sectors. With increasing demands for innovative financial services, capital markets in West Africa will eventually develop. Another source of hope is the twist in events in favour of the private sector as the engine of economic

growth. The likelihood of chunks of credit moving to the private sector in these West African countries is very high.

Trade activities, especially the overly dependence on imports of goods and services in West Africa, leave less to be desired. In about all the WAMZ and WAEMU countries, imports have trumped exports for some time now. Exports have been dominated mainly by raw agrarian goods and crude minerals and oil. This situation exposes West African economies to dire needs of beefing-up their BOPs, since the prices of their imports are determine by their trade partners—which usually are unfavourable. The global climatic changes have not helped matters, especially for West African economies that lie in the arid climatic region. Recent droughts have reinforced the need to supplement local production by imports. The agonizing part is that since most of these countries face political crises, scarce resources are not used for the rightful imports but for the acquisition of sophisticated ammunitions.

The recent economic growth patterns in these West African countries often mimic the financial development paths. For periods that benefitted tremendous financial deepening, real GDP grew faster; the reverse is true to some extent. While it is obvious that financial deepening contributed to the growth of many of these West African countries in recent years, we cannot downplay the terrific impact of imports (especially technology), good harvests, stable domestic and world prices, the buoyancy of the tourism sectors, the improvement in electricity delivery, the increase in literacy rates, and the role of oil discovery (especially in Ghana and Niger). On the whole, the WAMZ outperformed the WAEMU in terms of economic growth.

The next chapter is built on this one. After understanding the trends in economic activities over the years in West Africa in the current chapter, the extent of the impact of each activity on one another will now be examined. This will help shape the existing knowledge on the policy path to follow in order to achieve a particular macroeconomic goal.

CHAPTER FOUR

METHODOLOGY

4.1 Introduction

The chapter presents the necessary analytical framework on which this study is built. The rationale is to consign the study to an appropriate methodological platform. The chapter considers econometric procedures that differ from the ones employed by previous studies. These allow the study to look at the finance-growth debate from a different empirical angle as opposed to those presented in Table 2.1 in Chapter Two.

For the above motive to be achieved, this chapter is subdivided into three (3) main sections. The first section is dedicated to specifying the theoretical model and providing justification for this model. The second section outlines the empirical model and the econometric methodology employed in the study. The third section provides the description of the data to be used for the study, while the last section provides the conclusion for this chapter.

4.2 The Theoretical Model

Panel data are cross-sectional data observed over time²². For instance, when the same households, firms or countries are observed over a couple of years, the data is panel. Panel data are also known as longitudinal data. In the current study, panel data procedures suit the investigation because the study is

²² Hsiao (1986), and Greene (2003; chapter13) provide more technical exposition.

considering twelve (12) countries over a period of seventeen (17) years (1992—2009).

In general:

$$Y_{it} = \alpha + \beta X_{it} + U_{it} \dots \dots \dots (1)$$

Panel data have following advantages over pooled data (Baltagi 2004): (1) panel data account for heterogeneity across individual units which are assumed away in pooled data, (2) time-invariant omitted variables often found in pooled data are easily catered for in panel data, (3) panel data are less likely to have problems with autocorrelation and multicollinearity as time series data do. Arellano (2003) emphasizes the first point as the advantage from using panel data.

There are basically two types of panel models, the fixed effects and the random effects model. They differ by their assumptions on how the heterogeneity is captured and in the estimation techniques used.²³

Following the recent example by Ang and McKibbin (2007), and Gries et al (2009), a composite indicator of financial deepening to obtain an indicator that is as broad as possible was constructed. Specifically, the study used the finance proxies domestic credit to private sector as percentage of GDP (*pcrdbgdp*), domestic credit provided by banking sector as percentage of GDP (*dbagdp*) and liquid liabilities as percentage of GDP (*llgdp*) to construct this index, took the logarithm of this indicator and labelled it Depth (*DEEP*), via a principal component analysis (PCA). By constructing Depth (*DEEP*) to

²³ For Fixed effects, OLS is used and for Random effects, GLS is used.

measure financial deepening, the study avoids the imbalanced representation of certain aspects of financial deepening when narrow finance indicators are used. It also ensures that the study avoids the problems associated with multicollinearity and over-parameterization. As stated above, West African financial systems are strongly bank based, so the study will use finance indicators that are primarily associated with bank development.²⁴

In the related literature several proxies for financial deepening have been suggested, for example, monetary aggregates such as M2 to GDP. This follows the Financial Interrelations Ratio, the pioneering work of Goldsmith (1969, 1987). Till date, there has not been any consensus on the superiority of any indicator.

4.3 The Empirical Model

$$RGDP_{it} = \alpha + \alpha_{1t}OPEN_{it} + \alpha_{2t}DEEP_{it} + \varepsilon_{it} \dots \dots \dots (2)$$

Where $RGDP_{it}$ is the logarithm of real GDP per capita for the ith country in period t , $OPEN_{it}$ is the logarithm of the sum of exports and imports to real GDP for the ith country in period t and $DEEP_{it}$ is the logarithm of a composite indicator of financial deepening for the ith country in period t . ε_{it} is the error term for the ith country in period t , α is the intercept term, α_{1t} and α_{2t} measure the long run elasticities of economic growth with respect to trade openness and financial deepening, respectively. The expected signs of the coefficients are positive, as justified by King and Levine (1993), and Harrison (1996).

²⁴ See Gries et al (2009) for similar explanation.

4.3.1 Econometric Methodology

The empirical investigation of the linkages among financial deepening, trade openness and economic growth involves three steps. First, the study will examine the existence of unit root in each of the three panel variables. If unit roots are detected in the variables, the study will proceed to test for a long-run cointegration relationship among the variables. Finally, panel vector error correction model will be estimated in order to test Granger causality between these variables, if the study is able to establish the existence of long run cointegration relationships between the variables. However, if no cointegration is established, then Granger causality will be tested in a panel vector autoregressive framework.

4.3.2 Testing for Unit Roots in Panel Data

Testing for panel unit roots is quite recent and many researches and thesis applying panel data still disregard this crucial step. The study will test for the stationarity of Growth (*RGDP*), Depth (*DEEP*) and Openness (*OPEN*) before running the cointegration and causality test. Building on these tests, spurious empirical findings are avoided in the later causality analyses. Panel unit root tests are similar but not identical to unit root tests carried out in time series analysis (Sichei, 2008). All panel unit roots begin with the following:

$$Y_{it} = \delta_i Y_{it-1} + \lambda X_{it} + U_{it} \dots \dots \dots (3)$$

If $|\delta_i| < 1$, Y_{it} weakly (trend) stationary. On the other hand if $|\delta_i| = 1$, Y_{it} then contains a unit root. This can be simplified further by subtracting Y_{it-1} on both sides so that

$$\Delta Y_{it} = (\delta_i - 1)Y_{it-1} + \lambda X_{it} + U_{it} \dots \dots \dots (4)$$

Assuming that $\rho_i = (\delta_i - 1)$, our ADF type-model is:

$$\Delta Y_{it} = \rho_i Y_{it-1} + \lambda X_{it} + \sum_{j=1}^{p_i} \theta_{ij} \Delta Y_{it-j} + U_{it} \dots \dots \dots (5)$$

For purposes of testing, there are two natural assumptions: (1) assume that the persistence parameters are common across the cross-sections so that $\rho_i = \rho$; and (2) assume that ρ_i varies with cross-sections.

None of the available panel unit root tests is free from some statistical shortcomings, in terms of size and power properties. The study will employ two panel unit root tests to examine the stationarity property of our panel variables, namely: Im, Pesaran and Shin (IPS, 2003) and Choi (2001).²⁵ These two are chosen because they outperform the LLC (2002), for instance, for several variables.

4.3.2.1 Im, Pesaran and Shin (IPS) Test

IPS²⁶ begins by specifying a separate ADF regression for each cross-section.

That is,

$$\Delta y_{it} = \alpha_i y_{1t-1} + \sum_{j=1}^{P_i} \gamma_{ij} \Delta y_{it-j} + X'_{it} \delta + \varepsilon_{it} \dots \dots \dots (6)$$

²⁵ Most studies employed two or more tests (see, Agbetsiafa, 2003; Abu-Bader and Abu-Qarn (2005); Waqabaca, 2004; Demetriades and Hussein, 1996; Odhiambo, 2008). The current study agrees with the assertion that none of the tests is free from errors; hence, the use of two unit root tests. All the other sections are based on this assumption.

²⁶ See Im, Pesaran, and Shin (2003 pp.53-74) for more details.

Where $\Delta y_{it} = y_{it} - y_{it-1}$, y_{it} ($i = 1, 2, \dots, n$; $t = 1, 2, \dots, T$) is the series under investigation for country i over period t , p_i is the number of lags in the ADF regression and ε_{it} errors are assumed to be identically and normally distributed random variables for all i and t with zero mean and finite heterogeneous variance σ_i^2 . Both α_i and p_i in equation (6) are allowed to vary across countries.

The following hypotheses can be made using this procedure:

$H_0: \alpha_i = 0$, There is a unit root for some i 's

$H_a: \alpha_i < 0$, There is no unit root for at least one i

There are two stages for constructing the t-bar statistic which is proposed by Im, Pesaran and Shin (2003). At the first stage the average value of the individual ADF t-statistic for each of the countries in the sample is calculated which is given by

$$\bar{t}_{nT} = \frac{1}{n} \sum_{i=1}^n t_{iT}(p_i) \dots \dots \dots (7)$$

Where $t_{iT}(p_i)$ is the calculated ADF test statistic for country i of the panel ($i = 1, 2, \dots, n$). The second step is to calculate the standardized t-bar statistic which is given by

$$Z_{\bar{t}_{nT}} = \frac{\sqrt{n} \left[\bar{t}_{nT} - \frac{1}{n} \sum_{i=1}^n E(\bar{t}_{iT}(p_i)) \right]}{\sqrt{\frac{1}{n} \sum_{i=1}^n \text{var}(\bar{t}_{iT}(p_i))}} \sim N(0,1) \dots \dots \dots (8)$$

The expression for the expected mean, $E(\bar{t}_{iT}(p_i))$ and variance, $\text{var}(\bar{t}_{iT}(p_i))$, of the ADF regression t-statistics are provided by IPS for various values of the T and p and differing test equation assumptions. However, Im et al (2003) indicated that in the presence of cross-sectional dependence, the data can be

adjusted by demeaning and that the standardized demeaned t-bar statistic converges to the standard normal in the limit.

4.3.2.2 Choi Test

Choi (2001) derived an interesting statistic which is given by

$$Z = \frac{1}{\sqrt{n}} \sum_{i=1}^n \Phi^{-1}(p_i) \sim N(0, 1) \dots \dots \dots (9)$$

Where Φ^{-1} is the inverse of the standard normal cumulative distribution function.

4.3.3 Panel Cointegration

This section tackles the first objective of estimating the short and long run relationships between financial deepening, trade openness, and economic growth in West Africa. Panel cointegration tests are necessary when the variables employed for a study exhibit non-stationary properties (Persyn and Westerlund, 2007). The Pedroni Test and the Westerlund Test are used in this study because they do not impose common-factor restriction. Common-factor restriction has often led to the failure to reject the null hypothesis of no cointegration.²⁷

4.3.3.1 The Westerlund Cointegration Error-correction Tests

Following Westerlund (2007), the cointegration error-correction tests assume the following data-generating process:

²⁷ See for instance Banerjee et al (1998) and Kremers et al. (1992)

$$\Delta y_{it} = \delta' d_t + \alpha_i (y_{i,t-1} - \beta' x_{i,t-1}) + \sum_{j=1}^{p_i} \alpha_{ij} \Delta y_{i,t-j} + \sum_{j=-q_i}^{p_i} \gamma_{ij} \Delta x_{i,t-j} + e_{ij} \dots (10)$$

where $t = 1, \dots, T$ and $i = 1, \dots, N$ index the time-series and cross-sectional units, respectively, while d_t contains the deterministic components, for which there are three cases. In the first case, $d_t = 0$ so (10) has no deterministic terms; in the second case, $d_t = 1$ so Δy_{it} is generated with a constant; and in the third case, $d_t = (1, t)'$ so Δy_{it} is generated with both a constant and a trend. For simplicity, the K -dimensional vector $x_{i,t}$ is modelled as a pure random walk such that $\Delta x_{i,t}$ is independent of e_{it} ; and it is further assumed that these errors are independent across both i and t . Any dependence across i will be handled by means of bootstrap methods.

Equation (10) could be written as:

$$\Delta y_{it} = \delta' d_t + \alpha_i y_{i,t-1} + \lambda'_i x_{i,t-1} + \sum_{j=1}^{p_i} \alpha_{ij} \Delta y_{i,t-j} + \sum_{j=-q_i}^{p_i} \gamma_{ij} \Delta x_{i,t-j} + e_{ij} \dots (11)$$

where $\lambda'_i = -\alpha_i \beta'_i$. The parameter α_i determines the speed at which the system corrects back to the equilibrium relationship $y_{i,t-1} - \beta' x_{i,t-1}$ after a sudden shock. If $\alpha_i < 0$, then there is error correction, which implies that $y_{i,t}$ and $x_{i,t}$ are cointegrated; if $\alpha_i = 0$, then there is no error correction and, thus, no cointegration. The null hypothesis of no cointegration could be stated as $H_0: \alpha_i = 0$ for all i . The alternative hypothesis depends on what is being assumed about the homogeneity of α_i . Two of the tests, called group-mean tests, do not require the α_i s to be equal, which means that H_0 is tested versus $H_1^g: \alpha_i < 0$ for at least one i . The second pair of tests, called panel tests,

assume that α_i is equal for all i and are, therefore, designed to test H_0 versus $H_1^p: \alpha_i < \alpha < 0$ for all i .

Computing the Group-mean Tests

The group-mean tests can be constructed in three steps. The first step is to estimate (11) by least squares for each unit i , which yields

$$\Delta y_{it} = \delta_i' d_t + \tilde{\alpha}_i y_{i,t-1} + \tilde{\lambda}_i' x_{i,t-1} + \sum_{j=1}^{p_i} \tilde{\alpha}_{ij} \Delta y_{i,t-1} + \sum_{j=-q_i}^{p_i} \tilde{\gamma}_{ij} \Delta x_{i,t-1} + \tilde{\epsilon}_{it} \dots (12)$$

where the lag and lead orders, p_i and q_i , are permitted to vary across individuals and can be determined preferably by using a data-dependent rule.

Having obtained $\tilde{\epsilon}_{it}$ and $\tilde{\gamma}_{ij}$, the second step is to compute

$$\tilde{u}_{it} = \sum_{j=-q_i}^{p_i} \tilde{\gamma}_{ij} \Delta x_{i,t-1} + \tilde{\epsilon}_{it} \dots \dots \dots (13)$$

which can then be used to obtain $\tilde{\alpha}_i(1) = \tilde{\omega}_{ui}/\tilde{\omega}_{yi}$, where $\tilde{\omega}_{ui}$ and $\tilde{\omega}_{yi}$ are the usual Newey and West (1994) long-run variance estimators based on \tilde{u}_{it} and Δy_{it} , respectively.

The third step is to compute the group-mean tests in the following way:

$$G\tau = \frac{1}{N} \sum_{i=1}^N \frac{\tilde{\alpha}_i}{SE(\tilde{\alpha}_i)}, \quad G\alpha = \frac{1}{N} \sum_{i=1}^N \frac{T\tilde{\alpha}_i}{\tilde{\alpha}_i(1)} \dots \dots \dots (14)$$

Where $SE(\tilde{\alpha}_i)$ is the conventional standard error of $\tilde{\alpha}_i(1)$.

Computing the Panel Tests

The panel tests can be computed in three steps. The first step is the same as for the group-mean tests and involves regressing Δy_{it} and $y_{i,t-1}$ onto d_t , the lags

of Δy_{it} , and the contemporaneous and lagged values of Δx_{it} . This yields the projection errors

$$\Delta \tilde{y}_{it-1} = \Delta y_{it-1} - \tilde{\delta}'_i d_t - \tilde{\lambda}'_i x_{i,t-1} - \sum_{j=1}^{p_i} \tilde{\alpha}_{ij} \Delta y_{i,t-j} - \sum_{j=-q_i}^{p_i} \tilde{\gamma}_{ij} \Delta x_{i,t-j} \dots \dots (15)$$

And

$$\tilde{y}_{it-1} = y_{it-1} - \tilde{\delta}'_i d_t - \tilde{\lambda}'_i x_{i,t-1} - \sum_{j=1}^{p_i} \tilde{\alpha}_{ij} \Delta y_{i,t-j} - \sum_{j=-q_i}^{p_i} \tilde{\gamma}_{ij} \Delta x_{i,t-j} \dots \dots \dots (16)$$

The second step is to make use of $\Delta \tilde{y}_{it}$ and \tilde{y}_{it-1} in estimating the common error-correction parameter, α , and its standard error. In particular, $\tilde{\alpha}$ is computed as:

$$\tilde{\alpha} = \left(\sum_{i=1}^N \sum_{t=2}^T \tilde{y}_{i,t-1}^2 \right)^{-1} \sum_{i=1}^N \sum_{t=2}^T \frac{1}{\tilde{\alpha}_i(1)} \tilde{y}_{i,t-1} \Delta \tilde{y}_{it} \dots \dots \dots (17)$$

The standard error of $\tilde{\alpha}$ is

$$SE(\alpha) = \left((\tilde{S}_N^2)^{-1} \sum_{i=1}^N \sum_{t=2}^T \tilde{y}_{i,t-1}^2 \right)^{-1/2} \dots \dots \dots (18)$$

Where $\tilde{S}_N^2 = 1/N \sum_{i=1}^N \tilde{\sigma}_i / \tilde{\alpha}_i(1)$, with $\tilde{\sigma}_i$ being the estimated regression standard error in (12)

The third step is to compute the panel statistics as

$$P_\tau = \frac{\tilde{\alpha}}{SE(\tilde{\alpha})}, \quad P_\alpha = T \tilde{\alpha} \dots \dots \dots (19)$$

4.3.3.2 Pedroni Panel Cointegration Test

The Pedroni (1999) Test of cointegration begins with the regression:

$$y_{it} = \alpha_i + \delta_i t + \beta_{1i} x_{1it} + \beta_{2i} x_{2it} + \dots + \beta_{mi} x_{mit} + e_{it} \dots \dots (20)$$

$$t = 1, 2, \dots, T, i = 1, 2, \dots, N, m = 1, 2, \dots, M$$

Where y and x are assumed to be integrated of order 1; the parameters α_i and δ_i are individual and trends effects which may be set to zero if desired. Under the null hypothesis that there is no cointegration, the residuals will be I(1). The next step is similar to the Engle-Granger cointegration test. An auxiliary regression of the form as seen below is estimated.

$$\Delta e_{it} = \rho_i e_{it-1} + \sum_{j=1}^{\rho_i} \varphi_{ij} \Delta e_{it-j} + v_{it} \dots \dots \dots (21)$$

The Pedroni panel statistics are then constructed from this residual. The main statistics of interest are the within group test statistics. They are estimated as follows:

Panel v-statistic:

$$T^2 N^3 Z_{VNT} = \frac{T^2 N^{\frac{3}{2}}}{\sum_{t=1}^T \sum_{n=1}^N L_{1,1}^{-2} \hat{e}_{it}^2} \dots \dots \dots (22)$$

Panel ρ -statistic:

$$T \sqrt{N} Z_{\rho NT} = \frac{T \sqrt{N} [\sum_{t=1}^T \sum_{n=1}^N L_{1,1}^{-2} (\hat{e}_{it}^2) - \hat{\lambda}_i]}{\sum_{t=1}^T \sum_{n=1}^N L_{1,1}^{-2} \hat{e}_{it}^2} \dots \dots (23)$$

Panel t-statistic:

$$Z_{tNT} = \sqrt{\sigma_{NT}^2 \sum_{t=1}^T \sum_{n=1}^N L_{1,1}^{-2} \hat{e}_{it-1}^2} [\sum_{t=1}^T \sum_{n=1}^N L_{1,1}^{-2} (\hat{e}_{it}^2) \Delta \hat{e}_{it}^2 - \hat{\lambda}_i] \dots (24)$$

These are followed by three between group statistics. Pedroni (1999) showed that these standardized statistics are asymptotically normally distributed.

4.3.4 Testing for Causality

Attention is now turned to the causal relationships between financial deepening, trade openness and economic growth in the selected West African countries, which is the second objective of the study. For all other reasons²⁸, the study will employ a dynamic Granger causality test to examine the causal relationship between financial deepening, trade openness and economic growth. The main reason why the Granger causality test is favoured among other test procedures is due to its robust response to both large and small samples. The Granger causality test based on error-correction model can be expressed as follows:

$$y_t = \alpha_0 + \sum_{i=1}^n \alpha_{1i} y_{t-i} + \sum_{i=1}^n \alpha_{2i} x_{t-i} + \alpha_3 EC_{t-1} + u_t \dots \dots \dots (25)$$

$$x_t = \beta_0 + \sum_{i=1}^n \beta_{1i} y_{t-i} + \sum_{i=1}^n \beta_{2i} x_{t-i} + \beta_3 EC_{t-1} + \varepsilon_t \dots \dots \dots (26)$$

Where:

y_t, x_t are the underlying variables in the causal relationship. Restricted in this way in the current situation, y_t represents economic growth and x_t and represents financial deepening. EC_{t-1} is one period lagged error-correction term captured from the cointegration regression. u_t, ε_t are mutually uncorrelated white noise residuals.

The error-correction model has an interesting temporal causal interpretation in the sense that a bivariate cointegrated system must have a causal ordering in at least one direction (Engel and Granger, 1987). A thing about cointegrating

²⁸ See Odhiambo (2008), and Baltagi et al., (2009) for details.

relationship is that, though it reveals the presence of Granger causality, it does not point the direction of causality between variables. This is why an appropriate Granger causality test procedure is justified after testing for cointegration. Again, the use of an error-correction model in the Granger causality test allows the study to differentiate between short-run and long-run Granger causality. Specified in this way, the F-test on the regressors provides the short-run causal effects, while the significance of the t-test of the lagged error-correction term indicates the long-run causal effects. In this particular case, x_t Granger causes y_t in the long-run if $\alpha_{2i} \neq 0$ and $\alpha_3 \neq 0$.

A third variable will be introduced into the above model, as it has been detected by past studies that a bivariate framework is unreliable. That is, a new important variable if introduced in a bivariate framework could change the direction of causality and magnitude of the estimate. This important revelation is due to studies such as Caporale and Pittis (1997), and Loizides and Vamvoukas (2005).

The trivariate Granger causality test based on error-correction model can be expressed as follows:

$$y_t = \gamma_0 + \sum_{i=1}^m \gamma_{1i} y_{t-i} + \sum_{i=1}^n \gamma_{2i} x_{t-i} + \sum_{i=1}^n \gamma_{3i} z_{t-i} + \gamma_4 EC_{t-1} + \epsilon_t \dots \dots \dots (27)$$

$$x_t = \varphi_0 + \sum_{i=1}^m \varphi_{1i} y_{t-i} + \sum_{i=1}^n \varphi_{2i} x_{t-i} + \sum_{i=1}^n \varphi_{3i} z_{t-i} + \varphi_4 EC_{t-1} + \mu_t \dots \dots \dots (28)$$

$$z_t = \omega_0 + \sum_{i=1}^m \omega_{1i} y_{t-i} + \sum_{i=1}^n \omega_{2i} x_{t-i} + \sum_{i=1}^n \omega_{3i} z_{t-i} + \omega_4 EC_{t-1} + v_t \dots \dots \dots (29)$$

Where z_t is the third crucial variable affecting the relationship between x_t and y_t . In this case, trade openness is the third crucial variable affecting finance-growth relationship. ϵ_t, μ_t and v_t are mutually uncorrelated white noise residuals.

The main difference between a bivariate model presented in (25) and (26) and a trivariate model presented in (27)–(29) is the introduction of a third important variable affecting both financial deepening and economic growth (in this case trade openness). Based on the model presented in (27)–(29), it is possible that the causal link between financial deepening and economic growth estimated from (25) and (26) could be due to the omission of the trade openness variable. With the introduction of the trade openness variable, the model can now capture the causal relationship between financial deepening and economic growth with respect to changes in trade openness. Equation (27) to (29) could be expressed in a more testable form as follows:

$$\begin{bmatrix} RGDP_{it} \\ OPEN_{it} \\ DEEP_{it} \end{bmatrix} = \begin{bmatrix} \Theta_1 \\ \Theta_2 \\ \Theta_3 \end{bmatrix} + \sum_{k=1}^p \begin{bmatrix} \Phi_{11k} & \Phi_{12k} & \Phi_{13k} \\ \Phi_{21k} & \Phi_{22k} & \Phi_{23k} \\ \Phi_{31k} & \Phi_{32k} & \Phi_{33k} \end{bmatrix} \begin{bmatrix} RGDP_{it-k} \\ OPEN_{it-k} \\ DEEP_{it-k} \end{bmatrix} + \begin{bmatrix} \Gamma_1 \\ \Gamma_2 \\ \Gamma_3 \end{bmatrix} EC_{it-1} + \begin{bmatrix} \epsilon_{1it} \\ \epsilon_{2it} \\ \epsilon_{3it} \end{bmatrix} \dots \dots (30)$$

Where $i = 1, 2, \dots, n$; $t = p+1, p+2, \dots, T$. Θ_1, Θ_2 and Θ_3 , $\Phi_{11k}, \dots, \Phi_{33k}$, and Γ_1, Γ_2 and Γ_3 are the parameters to be estimated. EC_{it-1} represents the one period lagged error-term derived from the cointegration vector and the ϵ 's are the random variables or innovations (and are serially independent with zero mean and finite covariance matrix. All other notations carry their usual meaning in this study. The F-test was then used to check the direction of any causal relationship among the variables.

In this way, it was possible that the trade openness variable could not only alter the direction of causality between financial deepening and economic growth, but also the magnitude of the estimates (Loizides and Vamvoukas, 2005; Odhiambo, 2008).

4.4 Data Type, Source and Measurement

The study used a panel of twelve (12) West African countries between 1992 and 2009. These countries were then divided into two groups: West African Monetary Zone (WAMZ) and West African Economic and Monetary Union (WAEMU).

Data for the individual finance indicators was taken from the Financial Development and Structure Database of Beck, Demirguc-Kunt, and Levine (2001). Specifically, the study extracted the finance proxies; private credit²⁹ by deposit money banks to GDP (*pcrdbgdp*), deposit money bank assets to GDP (*dbagdp*), and liquid liabilities to GDP (*llgdp*).

Data for economic growth and trade openness was taken from the PENN World Table, version 7.0, compiled by Heston, Summers, and Aten (2011). For economic growth, the study used the logarithm of real GDP per capita (the logarithm of PPP converted GDP per capita derived from growth rate of c , g , i , at 2005 constant prices), labeled Growth (*RGDP*). For trade openness the logarithm of the sum of exports and imports to real GDP (the logarithm of openness at 2005 constant prices to PPP converted Gross Domestic Income

²⁹ Private Credit is probably the most important banking development indicator, not least because it proxies the extent to which new firms have opportunities to obtain bank finance (Baltagi et al., 2009). It measures “the ease with which any entrepreneur or company with a sound project can obtain finance,” Rajan and Zingales (2003) argued.

adjusted for terms of trade changes at 2005 constant prices), labelled Openness (*OPEN*)³⁰ was used.

4.5 Conclusion

This chapter was designed to establish the appropriate econometric tools that would be used to achieve the study objectives of: (1) estimating the short and long run relationships between economic growth, financial deepening, and trade openness, and (2) testing the causality between financial deepening, trade openness, and economic growth in West Africa. Basically, a theoretical panel model was regarded as best under the circumstance. The panel data captured all three variables, that is, financial deepening, trade openness and economic growth. The data was obtained from two main sources: Financial Development and Structure Database of Beck, Demirguc-Kunt, and Levine (2001), and PENN World Tables version 7.0 compiled by Heston, Summers and Aten (2011). PCA was used to construct the proxy for financial deepening. The logarithm of real GDP per capita and the logarithm of the sum of export and import to GDP were then used as the proxies for growth and openness, respectively. The data spans 17 years (1992 to 2009) and twelve (12) West African countries. These countries were then divided into WAMZ and WAEMU economic groupings.

³⁰As Harrison (1996) suggests, this measure is a simple and common indicator of trade openness.

The investigation of the linkages between financial deepening, trade openness and economic growth was done in three steps. The first involves testing for unit root among the three variables using the IPS and Choi methods. The second involves testing for the short and long run panel cointegration relationships between financial deepening, trade openness and economic growth using Pedroni and Westerlund methods. Finally, the causal linkages between these variables were done using the Engel-Granger procedure.

CHAPTER FIVE

RESULTS AND FINDINGS

5.1 Introduction

PCA was employed to construct a composite index to measure financial deepening. The Choi and IPS panel unit roots were presented. The study presented the Westerlund and Pedroni procedures for testing cointegration. The trivariate error correction model for testing the direction of causality between the variables was also explained. The study now presents the results and findings of these econometric techniques. The chapter is divided into five sections. The first section presents the results and findings of the principal component analysis (PCA) and the two unit root tests. The second section presents the outcome of the cointegration tests. The third provides the findings of the short and long run relationships between the three variables. The fourth section presents the investigations of the trivariate panel Granger causality; and the final section then summarises the whole chapter.

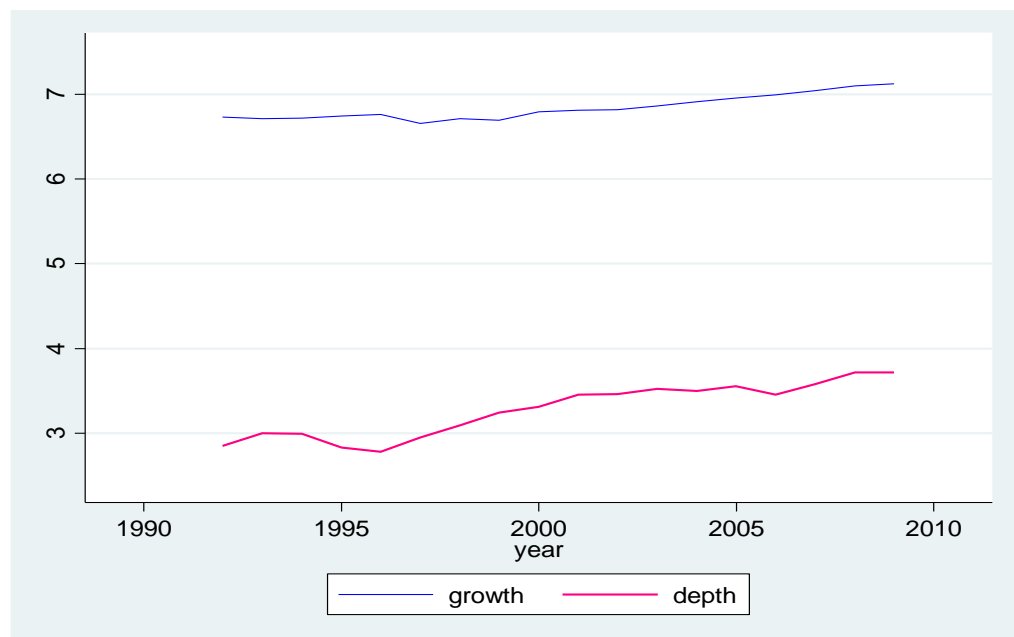
5.2 PCA and Panel Unit Root Tests

The proxy for financial deepening (*DEEP*) was constructed using principal component analysis (PCA). The steps for constructing *DEEP* are: (a) extract domestic credit to private sector as percentage of GDP (*pcrdbgdp*), domestic credit provided by banking sector as percentage of GDP (*dbagdp*) and liquid liabilities as percentage of GDP (*llgdp*); (b) form a (480x3) matrix of these variables; (c) construct a (3x1) matrix of eigenvalues and a (3x3) matrix of eigenvectors (principal components); (d) the principal component with the

highest eigenvalue (component 1) is then extract to form a (3x1) matrix; (e) the 3x1 matrix is then multiply to the (480x3) matrix, the raw data, to arrive at (1x480) matrix. But since this final data was of the form (1x480), it was transpose into the form (480x1). The results of the PCA are found in Tables 1.1 and 1.2 in Appendix A. The PCA result indicates that private sector credit as a percentage of GDP has the largest share in financial deepening³¹, accounting for 36.41% of the new measure, followed by domestic credit provided by the banking sector to GDP, 34.38%, and liquid liability to GDP, 29.21%.

The new measure of financial deepening has been plotted against real GDP growth in the West African Monetary Zone, and this is shown in Figure 5.1 below. The measure, label depth, has shown an interestingly positive relationship with growth; as real GDP growth increases, so does depth.

Figure 5.1: New Measure of Financial Depth in WAMZ

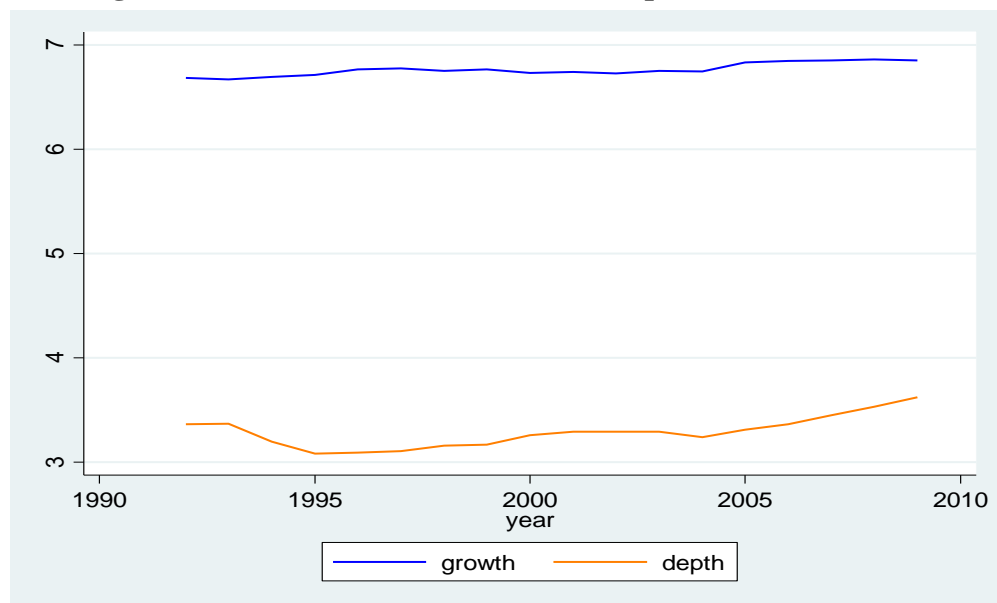


Source: Generated from PENN Table 7.0 and Beck et al (2001) with Stata 11

³¹ There have been some arguments that the amount of credit flowing to the private sector as a percentage of GDP should be the main indicator of financial deepening (see King and Levine, 1993; Rajan and Zingales, 1998). The findings here further advance those arguments.

Figure 5.2 below shows the relationship between the new variable, depth, and economic growth, proxy by real GDP growth, for the West African Monetary and Economic Union. Initially, as WAEMU experiences economic growth, financial development tends to decline, especially between 1992 and 1995. This situation reversed thereafter; economic growth beyond 1995 was accompanied by financial deepening.

Figure 5.2: New Measure of Financial Depth in WAEMU



Source: Generated from PENN Table 7.0 and Beck et al (2001) with Stata 11

The next step in the analysis was to divide the data into two: WAMZ and WAEMU. Two unit root tests were performed, in order to ensure robustness of the outcome.³² These unit root test were IPS and Choi. The results of the unit root tests are presented in Tables 5.1 and 5.2 below.

³² Two unit root tests were employed because none of the proposed panel unit root tests is free from errors. By employing two, it is possible to compare the results; hence, minimizing the chances of committing type one error which occurs when a true null hypothesis is rejected.

Table 5.1: Unit Root Tests for WAMZ

	IPS Test	P-value	Choi Test	P-value
<i>RGDP</i>	-1.2187	0.7450	9.7221	0.2851
<i>OPEN</i>	-1.8350	0.2184	-3.3666	0.9093
<i>DEEP</i>	-1.8336	0.2209	11.8492	0.1581

Note: RGDP=Real GDP Growth, OPEN=Trade Openness, DEEP=Financial Deepening

Source: Estimated from PENN Table 7.0 and Beck et al (2001) with Stata 11

The results in Table 5.1 show that Depth, Openness, and Growth have unit roots at 1% and 5% levels of significance, for all the two unit root tests. In other words, we fail to reject the null hypothesis of the existence of unit root for all three variables, which are already in their log-levels, at 1% and 5% levels of significance. The conclusion here is that Depth, Openness and Growth are I(1) time series in WAMZ. This result is consistent with the findings of Gries et al (2009), Agbetsiafa (2003), and Abu-Bader and Abu-Qarn, (2005). Due to the non-stationary nature of these variables, they cannot be used in a regression model without the possibility of spurious outcomes.

The results presented in Table 5.2 show that all three (3) variables (Depth, Openness and Growth) are non-stationary in WAEMU. Thus, the null hypothesis of the existence of unit root in Depth was rejected by IPS at 5% level but not at 1%. Apart from this, Choi test failed to reject the null hypothesis of the existence of unit root at 1% and 5%, for the three variables. Since IPS is data-sensitive, the conclusion of Choi test was preferred. Hence Depth is non-stationary. This means that all three variables have a unit root. The conclusion is consistent with the findings of Gries et al (2009) and Odhiambo (2008). Again, if non-stationary variables are employed in regression, the results are usually spurious—variables tend to show strong linear relationship even when they are unrelated in anyway.

Table 5.2: Panel Unit Root Tests for WAEMU

	IPS Test	P-value	Choi Test	P-value
<i>RGDP</i>	-1.4109	0.6440	8.23340	0.9416
<i>OPEN</i>	-1.3743	0.5070	11.3260	0.7889
<i>DEEP</i>	-1.8658	0.1040	14.9829	0.5259

Note: RGDP=Real GDP Growth, OPEN=Trade Openness, DEEP=Financial Deepening

Source: Estimated from PENN Table 7.0 and Beck et al (2001) with Stata 11

5.3 Panel Cointegration Analysis

The preceding section established that the three variables, namely, depth, openness and growth are non-stationary (or they contain at least one unit root) for both WAMZ and WAEMU countries. Since the three variables are non-stationary in both WAMZ and WAEMU countries, the requirement for testing the existence of cointegration is satisfied. That is, the underlying variables must be $I(1)$ or should have unit root.

The study employs the Westerlund and Pedroni Tests for panel cointegration to determine whether depth, openness and growth are cointegrated in WAMZ and WAEMU. Essence of considering the two panel cointegration tests is because none of the tests is free from errors. In other words, since all these approaches have their limitations, when they are combined in a single study, econometric decisions are easier to make (since the conclusions can quickly be compared).

5.3.1 Panel Cointegration Tests for WAMZ

The results for the panel cointegration tests are presented in Table 5.3. The two tests show that Depth, Openness and Growth are not cointegrated at 1%

and 5% levels of significance; it is consistent with Waqabaca (2004), and Demetriades and Hussein (1996). This is quite interesting because economic variables that are non-stationary tend to move together in the long run—a desirable property of cointegrated variables. Besides, the fact that most studies found cointegration relationships between these variables makes this finding more stunning.³³ The results confirmed that there is no long run cointegrating relationships between the three panel variables. In other words, Depth, Openness and Growth do not share a common trend and long-run equilibrium for the countries in WAMZ.

Table 5.3: Panel Cointegration Tests for WAMZ

Results for Westerlund's Panel Cointegration Test				
Statistic		Value	Z-value	P-value
Gt		-1.579	2.259	0.988
Ga		-8.171	1.490	0.932
Pt		-2.514	2.285	0.989
Pa		-5.333	1.525	0.936
Results of Pedroni Panel Cointegration Test (Within-dimension)				
	Statistic	P-value	Weighted Statistic	P-value
Panel v-Statistic	-648.6207	1.0000	0.985779	0.1621
Panel rho-Statistic	-0.134478	0.4465	-0.226320	0.4105
Panel PP-Statistic	0.066496	0.5265	-0.064291	0.4744
Panel ADF-Statistic	0.172118	0.5683	-0.029251	0.4883

Note: Gt, Gt, Pt, and Pa are the four Westerlund (2007) statistics

Source: Estimated from PENN Table 7.0 and Beck et al (2001) using Stata 11 (for Westerlund) and Eviews 7.0 for Pedroni

5.3.2 Panel Cointegration Tests for WAEMU

The results of the two panel cointegration tests show that Depth, Openness and Growth are not cointegrated in WAEMU at 1% and 5% levels of significance; it is also consistent with Waqabaca (2004), and Demetriades and Hussein (1996). This means that the variables do not move together in the long run.

³³ See, for instance, Agbetsiafa (2004), Luintel and Khan (1999), and Odhiambo (2008).

Economic variables that are non-stationary tend to share common long run trends. For forecasting purposes, it would have been desirable for the variables to be cointegrated. The results of the panel cointegration tests are presented in Table 5.4 below.

Table 5.4: Panel Cointegration Tests for WAEMU

Results for Westerlund's Panel Cointegration Test				
Statistic	Value	Z-value	P-value	
Gt	-8.026	-1.173	0.470	
Ga	-10.437	1.233	0.891	
Pt	-11.999	-0.694	0.450	
Pa	-12.477	-0.832	0.203	
Results of Pedroni Panel Cointegration Test (Within-dimension)				
	Statistic	P-value	Weighted Statistic	P-value
Panel v-Statistic	-328.7760	1.0000	-1.088534	0.8618
Panel rho-Statistic	0.935092	0.8251	0.885386	0.8120
Panel PP-Statistic	0.569694	0.7156	0.617273	0.7315
Panel ADF-Statistic	0.535080	0.7037	0.594068	0.7238

Note: Gt, Gt, Pt, and Pa are the four Westerlund (2007) statistics

Source: Estimated from PENN Table 7.0 and Beck et al (2001) using Stata 11 (for Westerlund) and Eviews 7.0 for Pedroni

The study could not establish any evidence of cointegrating relationships between financial deepening, trade openness, and economic growth. This implies that there no indication of the existence of long run causal linkages between these variables. To be able to proceed to the next step, the study discards the error correcting term in the proposed trivariate granger causality framework.

5.4 The Short and Long Run Dynamics of Depth, Openness and Growth

The cointegration tests in the preceding section failed to establish the existence of cointegrating relationships between Depth, Openness and Growth for WAMZ and WAEMU. These findings imply that the three variables do not

share any long-run trend or equilibrium relationships. Hence, the study proceeds to estimate the underlying short run dynamics of Depth, Openness and Growth in WAMZ and WAEMU. The results of the Hausman Test presented in Tables 5.5 and 5.6 shows that the Random Effects Model (REM) is preferred to the Fixed Effects Model (FEM) both for WAMZ and WAEMU countries at 1% and 5% levels of significance. The implication of the choice of REM over FEM is that cross-country characteristics matter in predicting growth levels within each of these economic blocs. That is to say, though the countries in a particular bloc may implement the same economic policies, the outcome will not be the same due to behavioural, institutional, structural, and endowment differences. The suitable model for explaining a situation like this one should be the REM.

Table 5.5: Hausman Test for WAMZ

Ho: Preferred Model is Random Effects

<i>$\Delta RGDP$</i>	Coefficients		Standard Errors
	Fixed	Random	
<i>$\Delta OPEN$</i>	.1216643	.1216689	.0041578
<i>$\Delta DEEP$</i>	.0000379	.0004491	.0028597
Chi-sq = 0.03			P-value = 0.9849

Note: *$\Delta RGDP$* , *$\Delta OPEN$* , and *$\Delta DEEP$* are the first differences of growth, openness, and depth, respectively.

Source: Estimated from PENN Table 7.0 and Beck et al (2001) with Stata 11

Table 5.6: Hausman Test for WAEMU

Ho: Preferred Model is Random Effects

<i>$\Delta RGDP$</i>	Coefficients		Standard Errors
	Fixed	Random	
<i>$\Delta OPEN$</i>	.2013675	.2055409	.0029664
<i>$\Delta DEEP$</i>	.0034587	.0012389	.0023824
Chi-sq=2.13			P-value=0.3445

Note: *$\Delta RGDP$* , *$\Delta OPEN$* , and *$\Delta DEEP$* are the first differences of growth, openness, and depth, respectively.

Source: Estimated from PENN Table 7.0 and Beck et al (2001) with Stata 11

5.4.1 Short Run Dynamics of Depth, Openness and Growth in WAMZ

The REM results for WAMZ in Table 5.7 show the short-run dynamics of the three variables. The results indicate that trade openness is positive and significant in determining growth at 1% and 5% level of significance. This finding is consistent with the findings of Harrison (1996), Edwards (1998), and Onafowora and Owoye (1998). Harrison found that a movement towards a more open trade regime in industrialised countries is associated with higher GDP growth, after accounting for other inputs. Financial deepening, on the other hand, is positive but not significant at 1% and 5% levels in predicting growth. Nonetheless, trade openness and financial deepening are jointly significant at 1% and 5% level in determining the level of growth in the WAMZ region. This confirms the claims that omitting an important variable in the finance-growth nexus may likely produce erroneous inferences. In other words, countries in the WAMZ that continue to implement financial depth-oriented policies with the aim of spurring growth may not achieve that purpose, without opening up their trade sectors. A variant of this conclusion was drawn by Odhiambo (2008), who found that savings is an important variable in the finance-growth nexus in Kenya.

Table 5.7: Random Effects for WAMZ

$\Delta RGDP$	Coefficient	Z	P-value
$\Delta OPEN$	.1216689	3.65**	0.000
$\Delta DEEP$	.0004491	0.02	0.985
Constant	.0060965	1.10	0.272
Wald Chi-sq(2)=13.40**			P-value=0.0012

Note: $\Delta RGDP$, $\Delta OPEN$, and $\Delta DEEP$ are the first differences of growth, openness, and depth, respectively.

Source: Estimated from PENN Table 7.0 and Beck et al (2001) with Stata 11

5.4.2 Short Run Dynamics of Depth, Openness, and Growth in WAEMU

Table 5.8 shows the results of the REM estimation. Ruling out the existence of cointegration among the three variables in WAEMU, the results show that trade openness is positive and significant in determining growth at 1% and 5% levels³⁴; financial deepening, on the contrary, is positive but not significant in determining growth at 1% and 5% levels of significance. However, financial deepening and trade openness are jointly important in explaining growth at 1% and 5% levels of significance, from the Wald statistic. Once again, neglecting an important variable in the financial-growth relationship could prove deleterious for policy-making. As the study found, policies that enhance financial development might not necessarily provide the stimulus for economic growth in WAEMU. Trade-enhancing policies should be considered when implementing financial policies in these countries (Gries et al, 2009).

Table 5.8: Random Effects for WAEMU

$\Delta RGDP$	Coefficient	Z	P-value
$\Delta OPEN$	.2055409	7.81**	0.000
$\Delta DEEP$	.0012389	0.05	0.961
Constant	.0049021	1.22	0.223
Wald Chi-sq(2) = 61.31**			P-value = 0.0000

Note: $\Delta RGDP$, $\Delta OPEN$, and $\Delta DEEP$ are the first differences of growth, openness, and depth, respectively.

Source: Estimated from PENN Table 7.0 and Beck et al (2001) with Stata 11

5.5 Trivariate Panel Granger Causality Tests

The findings from Section 5.3 revealed that Growth, Openness and Depth are not cointegrated for both the WAMZ and WAEMU countries. These results are in sharp contrast to the expected outcome of this study. The study expected all three panel variables to be cointegrated in the WAMZ and WAEMU

³⁴ Similar findings were revealed by Harrison (1996), Edwards (1998), and Gries et al (2009).

countries; so that an error correction model (ECM) can be specified in the trivariate granger causality framework.³⁵ But since this happen not to be the case; the study will now proceed to test for Granger causality in a trivariate VAR specification, where all three variables are differenced to remove the unit roots. The panel Granger causality test presented below is of two types: the F-test which conducts pairwise checks between two variables at a time and the Wald-test which checks the significance of each of the variables when one of them is assumed dependent on the other variables. This procedure was used by Onafowora and Owoye (1998), Waqabaca (2004), Asongu (2009), and Odhiambo (2008).

5.5.1 Trivariate Panel Granger Causality Tests in WAMZ

In other to tests for the causality between Depth, Openness and Growth in WAMZ, the study first tested for the presence of cointegration. It was established that Depth, Openness and Growth were not cointegrated in WAMZ. The three variables were then differenced once to ensure that they are stationary. A trivariate VAR was then specified in the panel Granger causality framework. The study tested for causality first using the pairwise F-test. The result of the F-test is presented in Table 5.9 below. This test shows that there are no causal relationships between Openness and Growth, Depth and Openness, and Depth and Growth at 1% and 5% levels of significance.

³⁵ See Odhiambo (2008), and Gries et al (2009).

Table 5.9: Pairwise Granger Causality Tests (3 lags) for WAMZ

Null Hypothesis	F-statistic	P-value
$\Delta OPEN$ does not Granger Cause $\Delta RGDP$	1.76278	0.1572
$\Delta RGDP$ does not Granger Cause $\Delta OPEN$	0.40430	0.7501
$\Delta DEEP$ does not Granger Cause $\Delta RGDP$	0.95761	0.4148
$\Delta RGDP$ does not Granger Cause $\Delta DEEP$	0.50589	0.6789
$\Delta DEEP$ does not Granger Cause $\Delta OPEN$	0.53889	0.6564
$\Delta OPEN$ does not Granger Cause $\Delta DEEP$	0.62671	0.5989

Note: $\Delta RGDP$, $\Delta OPEN$, and $\Delta DEEP$ are the first differences of growth, openness, and depth, respectfully

Source: Estimated from PENN Table 7.0 and Beck et al (2001) with Stata 11

The outcome of the above pairwise test should be interpreted cautiously. Pairwise Granger causality test tends to ignore the effects of the other variables in the model. This is why Loizides and Vamvoukas (2005), Odhiambo (2008) and Gries et al (2009), for instance, forewarn that bivariate causality models are prone to errors.

In other to check for robustness, the study runs a Block Exogeneity Wald Test on Depth, Openness and Growth for WAMZ. The result of the Wald test is presented in Table 5.10 below.

Table 5.10: Block Exogeneity Wald Test for WAMZ

Dependent Variable $\Delta RGDP$		
Excluded Variable	Chi-square	P-value
$\Delta OPEN$	5.759158	0.2179
$\Delta DEEP$	9.647275**	0.0468
All	15.55085**	0.0493
Dependent Variable $\Delta OPEN$		
$\Delta RGDP$	1.766930	0.7785
$\Delta DEEP$	3.392545	0.4944
All	4.625416	0.7968
Dependent Variable $\Delta DEEP$		
$\Delta RGDP$	3.587764	0.4647
$\Delta OPEN$	2.628491	0.6218
All	5.462434	0.7072

**implies significant at 5% level

Note: $\Delta RGDP$, $\Delta OPEN$, and $\Delta DEEP$ are the first differences of growth, openness, and depth, respectfully

Source: Estimated from PENN Table 7.0 and Beck et al (2001) with Eviews 7.0

The results for the Wald Test in Table 5.10 indicate the following at 5% level of significance:

- a) Openness, in the presence of Depth, does not Granger-cause Growth;
- b) Depth, in the presence of Openness, Granger-cause Growth;
- c) Depth and Openness Granger-cause Growth;
- d) Growth, given Depth, does not Granger-cause Openness;
- e) Depth, given Growth, does not Granger-cause Openness;
- f) Both Growth and Depth do not jointly Granger-cause Openness;
- g) Growth, given Openness, does not Granger-cause Depth;
- h) Openness, given Growth, does not Granger-cause Depth;
- i) And both Openness and Growth do not jointly Granger-cause Depth.

It should be pointed out that there exists a unidirectional causality running from financial deepening to economic growth, when trade openness is taken into account. Similarly, financial deepening and trade openness jointly cause economic growth in the West African Monetary Zone. This revelation concurs with the supply-leading hypothesis, whereby the development of financial institutions and financial services boosts economic performance of countries, especially, situations where financial institutions respond to the needs of the local industries Gerschenkron (1962, 1966). Besides, the claim that developing countries tend to be supply-leading, according to Jung (1986), is corroborated.

5.5.2 Trivariate Panel Granger Causality Tests in WAEMU

It was established in Section 5.3.2 that Growth, Openness and Depth are not cointegrated in the WAEMU countries. The study conducted two panel

Granger causality tests in a trivariate VAR framework and the results are presented in Tables 5.11 and 5.12.

Table 5.11: Pairwise Granger Causality Tests (3 lags) for WAEMU

Null Hypothesis	F-statistic	P-value
$\Delta OPEN$ does not Granger Cause $\Delta RGDP$	1.25785	0.2892
$\Delta RGDP$ does not Granger Cause $\Delta OPEN$	13.1827**	0.0000
$\Delta DEEP$ does not Granger Cause $\Delta RGDP$	1.20464	0.3084
$\Delta RGDP$ does not Granger Cause $\Delta DEEP$	3.43905**	0.0173
$\Delta DEEP$ does not Granger Cause $\Delta OPEN$	0.72298	0.5390
$\Delta OPEN$ does not Granger Cause $\Delta DEEP$	2.28151***	0.0794

** (***) implies significant at 5% and 10% levels

Note: $\Delta RGDP$, $\Delta OPEN$, and $\Delta DEEP$ are the first differences of growth, openness, and depth, respectively

Source: Estimated from PENN Table 7.0 and Beck et al (2001) with Eviews 7.0

The result of the pairwise F-test for causality is shown in Table 5.11 above. It shows that there is no causal relationship between Openness and Growth. The study found that Depth does not Granger-cause Growth but Growth Granger-causes Depth at 5% level of significance. Also, Depth does not Granger-cause Openness but Openness granger-causes Depth at 10% level of significance.

The above test, therefore, revealed a unidirectional causality running from economic growth to financial deepening in the West African Economic and Monetary Union. This conclusion is in consonance with the demand-following hypothesis surmised by Patrick (1966). In addition, the pairwise causality test indicated that there is a unidirectional causality running from trade openness to financial deepening. This conclusion is a one-way attestation to the Rajan-Zingales Hypothesis (conjectured by Rajan and Zingales, 2003), which states that trade openness and financial openness will enhance financial deepening required for economic growth.

However, these conclusions must again be interpreted with caution. As expounded earlier, pairwise Granger causality tests always ignore the role of the other variables in the model. In other words, the above conclusions may not hold if the third variable were taken into account. A Block Exogeneity Wald Test was performed in order to correct this anomaly; the result of is presented in Table 5.12 below.

Table 5.12: Block Exogeneity Wald Test for WAEMU

Dependent Variable $\Delta RGDP$		
Excluded Variable	Chi-square	P-value
$\Delta OPEN$	4.220919	0.3769
$\Delta DEEP$	44.66631**	0.0000
All	49.75473**	0.0000
Dependent Variable $\Delta OPEN$		
$\Delta RGDP$	11.78464**	0.0190
$\Delta DEEP$	17.57988**	0.0015
All	26.92878**	0.0007
Dependent Variable $\Delta DEEP$		
$\Delta RGDP$	6.639551	0.1562
$\Delta OPEN$	9.465665	0.0505
All	18.88975**	0.0155

**implies significant at 5% level

Note: $\Delta RGDP$, $\Delta OPEN$, and $\Delta DEEP$ are the first differences of growth, openness, and depth, respectively

Source: Estimated from PENN Table 7.0 and Beck et al (2001) with Eviews 7.0

The Block Exogeneity Wald Test presented in the table above took into account the influence of all the three variables in the study. The results show the following, at 5% level of significance:

- a) Openness, given Depth, does not Granger-cause Growth;
- b) Depth, given Openness, Granger-cause Growth;
- c) Openness and Depth jointly Granger-cause growth;
- d) Growth, given Depth, Granger-cause Openness;
- e) Depth, given Growth, Granger-cause Openness;
- f) Growth and Depth jointly Granger-cause Openness;

- g) Growth, given Openness, does not Granger-cause Depth;
- h) Openness, given Growth, does not Granger-cause Depth;
- i) And Growth and Openness jointly Granger-cause Depth.

The findings from this test above established a unidirectional causality running from financial deepening (via trade openness) to economic growth. It also established a joint unidirectional causality running from financial deepening and trade openness to economic growth in the West African Economic and Monetary Union. Once more, the supply-leading hypothesis is strengthened. This conclusion was also established by King and Levine (1993a, 1993b), Rajan and Zingales (1998), Jalilian and Kirkpatrick (2002). In particular, Edwards (1998) was one of the earliest to establish that financial deepening through trade openness caused economic growth. Since all countries in WAEMU are developing countries, the findings also agree with Jung's conclusion that developing countries tend to be supply-leading. Yung (1986) asserts that developing countries tend to follow supply-leading hypothesis. This means that, for WAEMU countries, the development of financial institutions and intermediaries is necessary to spur growth.

The study also revealed that financial deepening and economic growth may provide the avenues for trade openness—a conclusion reached by, for instance, Beck (2003), and Svaleryd and Vlachos (2005). This is somehow realistic because as countries grow both financially and economically, they tend to open up their trade sectors to foreign competition. This is evident in the large economies of the WAEMU such as Cote d'Ivoire and Senegal which have a common trade agreement with France. Finally, the test indicated that economic growth and trade openness simultaneously lead to financial

deepening in WAEMU. Harrison (1996) found this same conclusion in her study. However, the conclusion that trade openness causes economic growth in developing countries as reached by Onafowora and Owoye (1998) and Yanikkaya (2002) is rebuffed in this study.

5.6 Conclusion

The chapter presented the results of PCA and two stationarity tests, namely: IPS and Choi tests. The results of the IPS and Choi show that Depth, Openness and Growth are non-stationary for WAMZ and WAEMU.

To answer the first objective of estimating short and long run relationships between economic growth, trade openness, and financial deepening, the chapter also presented the results of two panel cointegration tests, namely: Westerlund and Pedroni for WAMZ and WAEMU. The result for both WAMZ and WAEMU indicated that all three variables are not cointegrated. Hence, no long-run relationship exists between these variables for WAMZ and WAEMU. The study established that the appropriate model for estimating the underlying short run dynamics among the three variables is the Random Effects Model. The REM showed that trade openness is essential in explaining economic growth in WAMZ and WAEMU but financial deepening is not. However, financial deepening and trade openness are jointly significant in explaining the level of growth in both WAEMU and WAMZ, further justifying the need for employing multivariate models in explaining the finance-growth nexus.

To answer the second objective of testing causality between the three variables, the study turned to the panel Granger causality framework. The absence of long-run relationships between financial deepening, trade openness and economic growth in WAMZ and WAEMU implies that the study has no a priori justification for using the proposed trivariate panel vector error correction model proposed in equation (30) of Chapter Four. The study therefore tested for Granger causality between the three variables in a trivariate VAR model. The study employed pairwise panel F-tests and Block Exogeneity Wald tests to examine the direction of the causality between these variables. The study dwelt on the Block Exogeneity Wald test as it provides room for the impact of all the variables in the model which was one of the objectives of this study. The study found the following causality patterns:

- There is a unidirectional causality running from financial deepening (via trade openness) to economic growth in WAMZ. Financial deepening and trade openness jointly sway economic growth in WAMZ. This confirms Patrick's supply-leading hypothesis.
- Financial deepening via trade openness causes economic growth in WAEMU. Economic growth via financial deepening causes trade openness. Financial deepening (indirectly, through economic growth) influences trade openness. This confirms the Rajan-Zingales Hypothesis. Besides, economic growth and trade openness jointly cause financial deepening in WAEMU.

CHAPTER SIX

SUMMARIES, CONCLUSIONS, AND RECOMMENDATIONS

6.1 Introduction

In the previous chapter, the results of PCA, panel stationarity tests, panel cointegration tests, and panel Granger causality tests were presented. In this chapter, the summaries, conclusions and recommendations are considered. The chapter is presented in four sections. The first section provides the summaries of the findings. The second section provides the conclusions of the study. The third section considers the recommendations emanating from the findings; and the last section points out the limitation of the study.

6.2 Summary

The study aimed to investigate the linkages between financial deepening, trade openness and economic growth in West Africa. The study proposed to implement modern panel econometric techniques to resolve the on-going finance-growth debate. In addition, the study proposed to investigate the finance-growth nexus by introducing trade openness which is one of the variables often left out in the debate.

In order to achieve the specific objectives of: (1) testing the causality between financial deepening, trade openness and economic growth and (2) estimating the short-run and long-run relationships between the growth, financial deepening, and trade openness, the study employed PCA method to resolve the problems of over-parameterisation often present when using proxies of financial deepening. Two modern panel unit root tests, namely: IPS and Choi

were used to examine the stationary properties of Depth, Openness and Growth. Similarly, two modern panel cointegration tests, namely: Westerlund and Pedroni tests were employed to examine the short and long run relationships between growth, financial deepening, and trade openness. The Hausman Test was also employed to establish whether the appropriate estimation method for the underlying short and long run relationships between the variables is the REM or FEM. Finally, the study employed the pairwise F-tests and the Block Exogeneity Wald tests to determine the direction of causality between the three variables.

The panel dataset for the twelve (12) West African countries covering 1992 to 2009 was divided into WAMZ and WAEMU. This was deemed appropriate because the countries in each block tend to share common economic characteristics such as common trade, financial policies and growth policies. Hence, the findings emanating from the individual specific block was very essential to that block alone. Most often than not, studies that take a holistic approach (that is, looking at the entire West Africa) tend to proposed recommendations that are not appropriate for the individual countries.

The unit root tests for countries in the WAMZ and WAEMU showed that Depth, Openness and Growth were non-stationary at 1% and 5% levels of significance; hence, using these variables in VAR models will produce spurious regressions. However, the variables were found to be stationary at 1% and 5% levels when they were differenced once. The I(1) nature of these variables make them suitable for investigating the short and long run cointegrating behaviours.

The study found no cointegrating relationships between Depth, Openness and Growth in WAMZ and WAEMU at 1% and 5% levels of significance which was in line with Demetriades and Hussein (1996) and Waqabaca (2004). Financial deepening, trade openness and economic growth do not share a common trend and long-run equilibrium in these blocs. This means the appropriate specification of a model containing financial deepening, trade openness and economic growth for WAMZ and WAEMU should not include the long-run dynamics or error correction terms.

The appropriate model for estimating the short run relationships between economic growth, trade openness and financial deepening, since cointegrating relationships are ruled out, is the random effects model (REM) at 1% and 5% for both WAMZ and WAEMU countries. The estimated REM for both WAMZ and WAEMU revealed that trade openness is positive and essential in explaining the level of economic growth at 1% and 5% which was consistent with Harrison (1996), and Edwards (1998); financial deepening, on the contrary, is positive but not significant in explaining the level of economic growth at 1% and 5%. Nevertheless, financial deepening and trade openness jointly explain the level of economic growth in WAMZ and WAEMU countries at 1% and 5%, further providing a caveat for employing bivariate models for analyzing the finance-growth nexus.

Finally, the results of the causality tests revealed that the pairwise F-test is not reliable since it ignores the impact of any other variables apart from the two under consideration.³⁶ One of the main objectives of this study was to examine the impact of an intervening variable in the finance-growth nexus for

³⁶ See the finding of Waqabaca (2004), who use Bivariate VAR.

which trade openness was chosen. So the study paid less attention to the pairwise F-test and more emphasis on the Block Exogeneity Wald test. The study reported the following from the Wald Test:

- There is a unidirectional causality running from financial deepening (via trade openness) to economic growth in WAMZ. This confirms Patrick's supply-leading hypothesis.
- Financial deepening via trade openness causes economic growth in WAEMU. Economic growth via financial deepening causes trade openness. Financial deepening (indirectly through economic growth) causes trade openness. This confirms the Rajan-Zingales Hypothesis.

6.3 Conclusions

The conclusions emanating from the study are that: there are no long-run cointegrating relationships between financial deepening, trade openness and economic growth in WAMZ and WAEMU; the underlying relationships between the variables is short run, and that causality runs from financial deepening to economic growth via trade openness for countries in WAMZ and WAEMU. Hence countries in WAMZ and WAEMU tend to follow the supply-leading hypothesis.

The study also corroborated the popular Rajan-Zingales Hypothesis. That is, it found that trade openness enhances financial deepening in countries of WAMZ and WAEMU. The implication to these countries is that they should open up their trade sectors in order to pave way for financial sector development.

6.4 Recommendations

In line with the above estimations, findings and conclusions, the study recommends the following:

First, countries in WAMZ and WAEMU should undertake sound financial liberalisation policies, as financial deepening was seen to be growth enhancing. Those policies should include elimination of credit ceilings and sectoral credit allocations, and the opening up of the local markets for external competition. Financial Service Authorities (FSA) should be established to monitor the activities of financial institutions and intermediaries. This is necessary since the financial industry thrives on credibility. Hence, safety and soundness of the financial industry is necessary to ensure high consumer confidence. Countries in WAMZ and WAEMU can also learn lessons from the collapse of giant financial markets such as the USA and Ireland. Again, these banking institutions should be established to work in tandem with all the industries in WAMZ and WAEMU countries. As argued elsewhere in financial literature, financial institution in the UK did not serve the need of the industries as was the case in Japan and Germany; hence the pace of economic development slowed in UK from the 19th century onwards (Gerschenkron, 1962; 1966); WAMZ and WAEMU countries must learn from this.

Secondly, the study revealed the importance of trade openness in the finance-growth nexus. It is now clear from this study that for financial liberalization policies in West Africa to achieve the objective of enhancing economic growth, trade policies must not be taken for granted. Therefore, countries in West Africa which continue to restrict foreign participation in their trade sectors must rethink this. However, the study proposes gradual trade

liberalisation since undue liberalisation could end up stifling the positive growth in exports. Mutually beneficial trade agreements can be a start. The study cautions West African countries not to jump into any trade agreements but ones that retains the countries' sovereignty. As countries in West Africa move towards common tariff and trade zones, the study proposes that member countries should adhere to the fundamental values of the membership agreement. These trade membership agreements should be exploited to increase the bargaining power of member countries in the global market.

The trade sectors of the countries in WAMZ and WAEMU, especially, the export sectors are still dominated by primary goods. Economies that rely so much in the export of primary goods are less likely to gain from knowledge and technological spillovers, industry linkages and dynamic externalities which enhance economic growth. Therefore, specialising in the export of primary goods is less than likely to engineer sustainable economic growth (Fosu, 1996). The study urges countries in the WAMZ and WAEMU to discourage the export of primary goods.

In sum, the policy recommendations of the McKinnon-Shaw Hypothesis are worth undertaken in countries of the WAMZ and WAEMU as the study found them (these countries) to be finance-led. But as evidenced in the study, such policies are not likely to produce long term growth, if they are not complemented by trade openness-oriented policies. Trade openness is essential if these countries want economic growth through financial liberalisation. In other words, financial liberalisation alone is not enough; they might have to consider liberalising their trade sectors. An important drawback of the financial systems of the West African countries is relatively

undeveloped nature of the securities market. Governments must consider implementing policies that can help develop these markets.

Other fundamental determinants of economic growth are available to be exploited. The study, therefore, recommends a more uniformed policy approach that also considers other fundamental factors such as political stability, institutional reforms, attitudinal reforms and responsible leaderships. Future studies could look into the causal linkages between growth and these factors.

6.5 Limitations of the study

The study employed PCA to construct a broad measure of financial deepening. The reason was to overcome the problems of multicollinearity and over-parameterisation associated with using different indices of financial deepening. However, this does not come without a cost. The limited interpretability of the composite index constructed makes the analysis prone to criticisms. This is, therefore, an improvement and not necessarily a solution to the previous measurement problems.

Modern econometric techniques were employed to investigate the linkages among financial deepening, trade openness and economic growth in West Africa. As is always the case, econometric procedures do not come without pitfalls. Two separate techniques could produce contrasting estimates and conclusions, as it was the case between the Pairwise F-test and the Block Exogeneity Wald Test. The implication is that the conclusions emanating from

this study should not just be taken prima facie. Inferences should be made when all theoretical issues are taken into account.

The proposed area of the study was West Africa, which is composed of sixteen (16) developing countries. However, the actual number of countries employed in the study was twelve (12). This is somehow misleading. The desire to investigate the linkages between financial deepening, trade openness and economic growth in WAMZ and WAEMU regions implies that the study could no longer include Mauritania. The dearth of data in Liberia and Guinea implies that the study could no longer have the total number of countries desired for both WAMZ and WAEMU regional groupings. Hence, the recommendations of the study were made in 'context'.

Finally, the measure of financial deepening, to some extent, is debatable since no securities indexes were included. This problem permeates virtually most studies in the region. Capital markets in the West African sub-region are relatively underdeveloped. This makes it difficult to capture stock market indexes in the measure of financial deepening. Future studies should incorporate the role of capital markets in the finance-growth debate.

REFERENCES

- Abu-Bader, S., Abu-Qarn, A. (2005). Financial Development and Economic Growth: Time Series Evidence from Egypt, Discussion Paper No. 05-14a. Monaster Center for Economic Research, Ben-Gurion University of the Negev, Israel.
- African Development Bank Data (2013). AfDB Statistics Department.
- Agbetsiafa, D.K., (2003). The finance growth nexus: evidence from sub-Saharan Africa. *International Advances in Economic Research* 9 (2), 6—9.
- Akinboade, O.A., (1998). Financial development and economic growth in Botswana: a test for causality. *Savings and Development* 22 (3), 331–348.
- Allen, F., Carletti, E., Cull, R., Qian, J. and Senbet, L. (2009). “The African Financial Development Gap,” University of Maryland/University of Pennsylvania working paper, September 2009, 323—378.
- Al-Yousif, Y.K., (2002). Financial development and economic growth: another look at the evidence from developing countries. *Review of Financial Economics* 11, 131–150.
- Ang, J. B., and McKibbin, W. J. (2007). Financial liberalization, financial sector development and growth: Evidence from Malaysia. *Journal of Development Economics*, 84, 215–233.
- Ang, J. B. (2008). Survey of recent development in the literature of finance and growth. *Journal of economic Surveys* 22, 536—576.
- Arellano, M., (2003). *Panel Data Econometrics* (Oxford University Press, Oxford).
- Arellano, M., Bond, S., (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations,. *Rev. Econ. Stud.* 58, 277–297.
- Arellano, M. and Bover, O. (1995). “Another look at the instrumental variable estimation of error-components models.” *Journal of Econometrics*, 68, 29-52.

Arestis, P. and Demetriades, P. (1997) "Financial Development and Economic Growth: Assessing the Evidence", *Economic Journal*, 107, 783—799.

Asongu, S. A. (2009). Financial Development, Trade Openness and Financial Openness: do income levels matter for developing countries? HEC-Management School, University of Liège, 21—35.

Atindehou, R. B., Gueyie, J. P., and Amenounve, E. K. (2005). Financial intermediation and economic growth: Evidence from Western Africa. *Applied Financial Economics*, 15(11), 777–790.

Balassa, B. (1989). *Comparative Advantage, Trade Policy, and Economic Development*, New York: New York University Press.

Baldwin, R. (1989). "Measureable Dynamic Gains from Trade," NBER Working Papers 3147, National Bureau of Economic Research, Inc.

Baltagi, B.H., (2005). *Econometric Analysis of Panel Data*. (John Wiley, Chichester).

Baltagi, B.H., Demetriades, P., Law, S.H., (2007). Financial development, openness and institutions: evidence from panel data. Discussion Paper No. 07/5. University of Leicester.

Banerjee, A., J. Dolado, and R. Mestre (1998). Error-correction mechanism tests for cointegration in a single-equation framework. *Journal of Time Series Analysis* 19:267–283.

Bardhan, P. and Kletzer, K. (1987). "Credit markets and patterns of international trade," *Journal of Development Economics*, Elsevier, vol. 27(1-2), pages 57-70, October.

Bencivenga, V., Smith, B., (1991). Financial intermediation and endogenous growth. *Review of Economic Studies* 58, 195–209.

Beck, T., (2002). Financial development and international trade. Is there a link? *Journal of International Economics* 57, 107–131.

Beck, T., Demirgüç-Kunt, A., Levine, R., (2003). A new database on financial development and structure. World Bank Group Working Paper No 2784.

Berthelemy, J. C., and Varoudakis, A. (1996). Economic growth, convergence clubs, and the role of financial development. *Oxford Economic Papers*, 48, 300–328.

Bagehot, W., (1873). *Lombard Street: A Description of the Money market*. Irwin, Homewood, Illinois. [1962 edition].

Bhattacharya, P., Sivasubramanian, M., (2003). Financial development and economic growth in India: 1970–1971 to 1998–1999. *Applied Financial Economics* 13 (12).

Blundell, R. and S. Bond. (1998). “Initial conditions and moment restrictions in dynamic panel data models.” *Journal of Econometrics*, 87(1), 115-143.

Buffie, E. F. (1984) Financial repression, the New Structuralists, and Stabilization Policy in Semi-industrialized Economics, *Journal of Development Economics*, 14, 305-22.

Caporale, G., Pittis, N., (1997). Causality and forecasting in incomplete system. *Journal of Forecasting* 16, 425–437.

Casselli, F., Esquivel, G., Lefort, F., (1996). Reopening the convergence debate: a new look at cross-country growth empirics. *Journal of Economic Growth* 1 (3).

Champ, B. and Freeman S. (2001). *Modeling Monetary Economics*. Second Edition, Cambridge University Press.

Chandavarkar, A. (1992). Of finance and development: Neglected and unsettled questions. *World Development*, 20(1), 133–142.

Chang, Y. (2004). Bootstrap unit root tests in panels with cross-sectional dependency. *Journal of Econometrics* 120: 263–293.

Chenery, H. B. (1960). "Patterns of Industrial Growth," *The American Economic Review*, 50(4), pp. 624-654. American Economic Association.

Chenery, H. B. and Taylor, L. (1968). "Development Patterns: Among Countries and Over Time," *The Review of Economics and Statistics*, 50(4), pp. 391-416. Cambridge: MIT Press.

- Choe, C., and Moosa, I. A. (1999). Financial system and economic growth: The Korean experience. *World Development*, 27(6), 1069–1082.
- Choi, I. (2001). Unit root tests for panel data, *Journal of International Money and Finance* 20, 249–272.
- Christopoulos, D. K., and Tsionas, E. G. (2004). Financial development and economic growth: Evidence from panel unit root and cointegration tests. *Journal of Development Economics*, 73, 55–74.
- Claessens, S., Laeven, L., (2003). Financial development, property rights, and growth. *J. Finance* 58, 2401–2436.
- Claessens, S., Demirgüç-Kunt, Huizinga, A., (2001). How does foreign entry affect domestic banking markets? *J. Banking & Finance* 25, 891–911.
- Clark, B. (1998). *Political-economy: A comparative approach*. Westport, CT: Preager.
- De-Gregorio, J., Guidotti, P., (1995). Financial development and economic growth. *World Development* 23 (3), 433–448.
- Demetriades, P. and Hussein, K. A. (1996) Does financial development cause economic growth. *Journal of Development Economics* 51, 387-411.
- Diamond, D W., and D. H. Dybvig (1983). "Bank Runs, Deposit Insurance, and Liquidity." *Journal of Political Economy* 91 (June): 401–19.
- Domar, E. (1946). "Capital Expansion, Rate of Growth, and Employment". *Econometrica* 14 (2): 137–47.
- Edwards, S. (1998). Openness, productivity and growth: What do we really know? *The Economic Journal*, 108, 383–398.
- Egbetunde, T. (2009), Financial intermediation and economic growth in sub-Saharan Africa (1980-2005). M. Sc thesis, Obafemi Awolowo University, Nigeria, 45—56.

- Engle, R. F., and Granger, C. W. J. (1987). Co-integration and error correction: Representation, estimation, and testing. *Econometrica*, 55(2), 251–276.
- Fosu, A. K. (1996). Primary Exports and Economic Growth in Developing Countries. *World Economy*, 19, 465-475.
- Fry, M. J. (1978). "Money and Capital or Financial Deepening in Economic Development." *Journal of Money, Credit and Banking* 10 (November): 464–75.
- Fry, M., (1988). *Money, Interest and Banking in Economic Development*. John Hopkins University Press, London.
- Fry, M. J. (1995). *Money, Interest, and Banking in Economic Development*, 2nd ed. Baltimore: Johns Hopkins University Press.
- Fry, M. J. (1997). *Emancipating the Banking System and Developing Markets for Government Debt*. London: Routledge.
- Galbis, V. (1977). "Financial Intermediation and Economic Growth in Less Developed Countries: A Theoretical Approach." *Journal of Development Studies* 13 (January): 58–72.
- Ghatak, S. (1997). *Financial liberalisation: The case of Sri Lanka*, *Empirical Economics*, Vol. 22
- Ghirmay, T. (2004). Financial development and economic growth in Sub-Saharan African countries: Evidence from time series analysis. *African Development Review*, 16(3), 415–432.
- Goldsmith, R. (1969). *Financial structure and development*. New York: Yale University Press.
- Granger, C. W. J. (1969). Investigating causal relations by econometric models and cross-spectral methods. *Econometrica*, 37(3), 424–438.
- Greenwood, J., Jovanovic, B., (1990). Financial development, growth, and the distribution of income. *Journal of Political Economy* 98, 1076–1107.

Greenwood, J. and B. Smith (1997). Financial markets in development, and the development of financial markets. *Journal of Economic Dynamic and Control* 21, 145 — 181.

Greenwald, B. C. and Stiglitz, J. E. (1994). "Asymmetric Information and the New Theory of the Firm: Financial Constraints and Risk Behavior," NBER Working Papers 3359, National Bureau of Economic Research, Inc.

Gries, T., Kraft, M., and Meierrieks, D., (2009). Linkages Between Financial Deepening, Trade Openness, and Economic Development: Causality Evidence from Sub-Saharan Africa. *World Development* Vol. 37, No. 12, pp. 1849–1860

Gupta, R. (2004). "Financial Liberalization and Inflationary Dynamics in the Context of Southern European Economies", Working Paper, University of Connecticut.

Habibullah, M. S., End, Y., (2006). Does financial development cause economic growth? A panel data dynamic analysis for the Asian developing countries. *Journal of the Asia Pacific Economy* 11 (4), 377–393.

Hakkio, C. S., and Rush, M. (1991). Cointegration: How short is the long run?. *Journal of International Money and Finance*, 10, 571–581.

Harrod, R. F. (1939). "An Essay in Dynamic Theory". *The Economic Journal* 49 (193): 14–33.

Harrison, A. (1996). Openness and growth: A time-series, cross-country analysis for developing countries. *Journal of Development Economics*, 48, 419–447.

Hausman, J. A. (1978). Specification tests in econometrics, *Econometrica* 46, 1251–1271.

Heston, A., Summers, R., and Aten, B. (2006). Penn World Table Version 6.2, income and prices at the University of Pennsylvania. Center for International Comparisons of Production.

Im, K.S., Pesaran, M.H., and Shin, Y., (2003): "Testing for unit roots in heterogeneous panels", *Journal of Econometrics*", 115, pp.53-74.

IMF. 2012. West African Economic and Monetary Union: Staff Report on Common Policies for Member Countries, March 2012.

IMF, World Economic Outlook Database, October 2012

Jalilian, H. and Kirkpatrick, C. (2002). Financial development and poverty reduction in developing countries. *International Journal of Finance and Economics* 7, 97 — 108.

Jalilian, H., Kirkpatrick, C. (2002). Financial Development and Poverty Reduction in Developing Countries. *International Journal Finance and Economics* 7 (2), 97—108.

Johansen, S., Juselius, K. (1990). Maximum Likelihood Estimation and Inference on Cointegration with Applications to the Demand for Money. *Oxford Bulletin of Economics and Statistics* 52, 169—210.

Jung, W.S. (1986) Financial Development and Economic Growth: International Evidence, *Economic Development and Cultural Change*, 34(2), 333-346.

Kapur, B. K. (1976) "Alternative Stabilization Policies for Less-developed Economies," *Journal of Political Economy*, University of Chicago Press, vol. 84(4), pages 777-95, August.

Keynes, J. M. (1937). *The General Theory of Employment*. *The Quarterly Journal of Economics* 51(2) 209—223.

King, R., Levine, R. (1993) Finance and Growth: Schumpeter might be right. *Quarterly Journal of Economics* 108(8), 713—717.

Kremers, J. J. M., N. R. Ericsson, and J. J. Dolado., (1992). The power of cointegration tests. *Oxford Bulletin of Economics and Statistics* 54: 325—348.

Krueger, A. O. (1978) "Liberalization, Direction of Bias, and Economic Growth," NBER Chapters, in: *Liberalization Attempts and Consequences*, pages 277-300 National Bureau of Economic Research, Inc.

Krugman, P. (1998). *Endogenous Growth Theory*, MIT Press, Cambridge, MA.

- Leamer, E. E. (1988) "Measures of Openness," NBER Chapters, in: Trade Policy Issues and Empirical Analysis, pages 145-204 National Bureau of Economic Research, Inc.
- Levine, R. (1991) "Stock Markets, Growth, and Tax Policy," *Journal of Finance*, XLVI, 1445-65.
- Levine, R. (1993) "Financial Intermediary Services and Growth," *Journal of Japanese and International Economics*, VI, 383-405.
- Levine, R., (2001). International financial liberalization and economic growth. *Rev. Int'l. Econ.* 9, 688–702.
- Levine, R., (2003). More on finance and growth: more finance more growth? *Fed. Reserve Bank of St. Louis Rev.* 85 (4), 31–46.
- Levin, A., Lin, C. F., Chu, C. S. (2002). Unit Root Tests in Panel Data: Asymptotic and Finite Sample Properties. *Journal of Econometrics* 108, 1—24.
- Loizides, J., and Vamvoukas, G. (2005). Government Expenditure and Economic Growth: Evidence from Trivariate Causality Testing. *Journal of Applied Economics* 8, 125—152.
- Luintel, K.B. and Khan, M. (1999). A Quantitative Reassessment of the Finance-Growth Nexus: Evidence from a Multivariate VAR, *Journal of Development Economics*, 60, 381-405.
- Mathieson, D. J. (1980). "Financial Reform and Stabilization Policy in a Developing Economy." *Journal of Development Economics* 7 (September): 359–95.
- Molho, L. E. (1986). "Interest Rates, Saving, and Investment in Developing Countries: A Re-examination of the McKinnon-Shaw Hypotheses," *IMF Staff Papers*, 33, 90-116 (March 1986).
- Montiel, P. J. (2003). Development of financial markets and macroeconomic policy. *Journal of African Economies*, 12(AERC Suppl. 2), 12–52.

- McKinnon, R. (1973). *Money and Capital in Economic Development*. Washington DC, The Brooking Institution.
- McKinnon, R.I., (1991). *The Order of Economic Liberalization: Financial Control in the Transition to a Market Economy*. Johns Hopkins University Press.
- Myint, H. (1984). The Classical Theory International Trade and the Underdeveloped Countries. *Economic Journal*, 68, 317—337.
- Newey, W. K., and West, K. D., (1994). Automatic lag selection in covariance matrix estimation. *Review of Economic Studies* 61: 631—653.
- Odhiambo, N. M. (2004). Is financial development still a spur to economic growth? A causal evidence from South Africa. *Savings and Development* 28, 47 — 62.
- Odhiambo, N. M. (2008). Financial depth, savings and economic growth in Kenya: a dynamic causal linkage. *Economic Modelling* 25, 704 — 713.
- Onafowora, O. A., Owoye, O. (1998). Can Trade Liberalisation Stimulate Economic Growth in Africa? *World Development*, Elsevier 26(3), 497—506, March.
- Pagano, M. (1993). Financial markets and growth. An overview. *European Economic Review*, 37, 613—622.
- Patrick, H.T. (1966). Financial development and economic growth in underdeveloped countries. *Economic Development and Cultural Change* 14, 174-89.
- Pedroni, P. (1999). Critical values for cointegration tests in heterogeneous panels with multiple regressors, *Oxford Bulletin of Economics and Statistics* 61, 653—678.
- Persyn, D., Westerlund, J. (2008). Error –correction-based Cointegration Tests for Panel Data. *The Stata Journal* 8 (2), 232—241.
- Quah, D., (1993). Empirical cross-section dynamics in economic growth. *European Economic Review* 37 (2–3).

Rajan, R. G., Zingales, L., (2003). The great reversals: the politics of financial development in the twentieth century. *J. Financial Econ.* 69, 5–50.

Robinson, J. (1952). *The rate of interest, and other essays*. London: Macmillan.

Schumpeter, J. A., (1912). *Theorie der Wirtschaftlichen Entwicklung* [The Theory of Economic Development]. Dunker & Humblot, Leipzig. (Translated by Redvers Opie, Cambridge, MA, Harvard University Press, 1934).

Seers, D. (1959). "An Approach to the short period analysis of primary-producing economies" *Oxford Economic Papers*, February 1959.

Shaw, E. (1973). *Financial Deepening in Economic Development*. Oxford University Press, London.

Sichei, M. (2008). *Econometrics Theory and Practice Part Two: Topics In Micro-Econometrics*. Lecture Notes, Kenya School of Monetary Studies, August/September 2008.

Solow, R., (1956). A contribution to the theory of economic growth. *Quarterly Journal of Economics* 70 (February).

Stern, N. (1989). The economics of development: a survey, *Economic Journal*, 100, pp. 597-685.

Svaleryd, H., Vlachos, J., (2002). Markets for risk and openness to trade: how are they related. *J. Int'l. Econ.* 57, 369–395.

Swan, T. W. (1956). *Economic Growth and Capital Accumulation*. *Economic Record* (John Wiley and Sons) 32(2), 334—361.

Taylor, L. (1983). *Structuralist Macroeconomics*. New York: Basic Books.

Todaro, M. and Smith, S. C. (2011) *Economic Development*, 11th ed. Pearson Education and Addison-Wesley.

Van Wijnbergen, S., (1982). "Stagflationary effects of monetary stabilization policies: A quantitative analysis of South Korea," *Journal of Development Economics*, Elsevier, vol. 10(2), pages 133-169, April

WAMI Report (2012). West African Monetary Institute.

Waqabaca, C., (2004). Financial Development and Economic Growth in Fiji. Working Paper 2004/03 (December). Economics Department, Reserve Bank of Fiji.

Westerlund, J. (2007). Testing for error correction in panel data. *Oxford Bulletin of Economics and Statistics* 69: 709–748.

Wickens, M. R. (1996). Interpreting cointegrating vectors and common stochastic trends. *Journal of Econometrics*, 74, 255–271.

World Bank (1989). *World Development Report 1989, Financial systems and development*, New York: Oxford University Press.

World Development Indicators, 2012

Yanikkaya, H., (2003). "Trade openness and economic growth: a cross-country empirical investigation," *Journal of Development Economics*, Elsevier, vol. 72(1), pages 57-89, October.

APPENDIX A**RELEVANT ESTIMATIONS****1. Results of Principal Component Analysis****Table 1.1 Rotation: (unrotated = principal)**

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	1.68878	0.911483	0.5629	0.5629
Comp2	0.777296	0.243371	0.2591	0.8220
Comp3	0.533925	.	0.1780	1.0000

Source: Estimated from Beck et al (2001) with Stata 11

Table 1.2 Principal components (eigenvectors)

Variable	Comp1	Comp2	Comp3	Unexplained
dbagdp	0.5931	-0.4959	0.6343	0
llgdp	0.5038	0.8431	0.1882	0
pcrdbgdp	0.6281	-0.2079	-0.7499	0

Source: Estimated from Beck et al (2001) with Stata 11

2. Correlation Matrix of the Financial Indicators**Table 2.1**

	dbagdp	llgdp	pcrdbgdp
dbagdp	1.0000		
llgdp	0.2433	1.0000	
pcrdbgdp	0.4553	0.3227	1.0000

Source: Estimated from Beck et al (2001) with Stata 11

3. Unit Root Test for the Differenced Variables.

Entire Data (West Africa)

Table 3.1 Variable: First Difference of Growth (_G)

Method	Statistic	P-value
IPS	-11.9813**	0.0000
Choi	171.644**	0.0000

** indicates rejection of H0 at 5% level of significance. Null Hypothesis: There is unit root.

Source: Estimated from Beck et al (2001) and PENN Table 7.0 with Stata 11

WAEMU

Table 3.2

Variable: First Difference of Growth (_G)		
Method	Statistic	P-value
IPS	-6.7685**	0.0000
Choi	34.3257**	0.0049
Variable: First Difference of Openness (_O)		
IPS	-6.7908**	0.0000
Choi	-9.2184**1	0.0000
Variable: First Difference of Depth (_D)		
IPS	-6.7326**	0.0000
Choi	-6.67177**	0.0000

** indicates rejection of H0 at 5% level of significance. Null Hypothesis: There is unit root.

Source: Estimated from Beck et al (2001) and PENN Table 7.0 with Stata 11

WAMZ

Table 3.3

Variable: First Difference of Growth (_G)		
Method	Statistic	P-value
IPS	-4.63328**	0.0000
Choi	32.7122**	0.0049
Variable: First Difference of Openness (_O)		
IPS	-6.4228**	0.0000
Choi	-8.45468**	0.0000
Variable: First Difference of Depth (_D)		
IPS	-6.2893**	0.0000
Choi	2.4836**	0.0000

** indicates rejection of H0 at 5% level of significance. Null Hypothesis: There is unit root.

Source: Estimated from Beck et al (2001) and PENN Table 7.0 with Stata 11

4. Results of Pedroni Panel Cointegration Test

WAMZ

4.1 Pedroni Panel Cointegration Test (Between-dimension)

	Statistic	P-value
Group rho-Statistic	0.447417	0.6727
Group PP-Statistic	0.442755	0.6710
Group ADF-Statistic	0.555850	0.7108

** indicates rejection of H0 at 5% level of significance. Null Hypothesis: There is unit root.

Source: Estimated from Beck et al (2001) and PENN Table 7.0 with Eviews 7.0

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4.2 Pedroni Individual Cointegration Test (Between-dimension)

	Statistic	P-value
Group rho-Statistic	1.010303	0.8438
Group PP-Statistic	0.573493	0.7168
Group ADF-Statistic	0.547140	0.7079

** indicates rejection of H0 at 5% level of significance. Null Hypothesis: There is unit root.

Source: Estimated from Beck et al (2001) and PENN Table 7.0 with Eviews 7.0