GLOBALIZATION, FINANCIAL MARKET DEVELOPMENT AND OUTPUT SUSTAINABILITY IN WEST AFRICAN COUNTRIES

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APPROVAL

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DEDICATION

This work is dedicated to the almighty God, the source of all things and to the lovers of knowledge.

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List of Acronyms

ADF	Augmented Dicky-Fuller
BOP	Balance of Payment
CD	Cross-sectional Dependence
ECOWAS	Economic Community of West African State
FD	Financial Market Development
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GFCF	Gross Fixed Capital Formation
GLS	Generalized Least Square
GMM	Generalized Method of Moment
INF	Inflation Rate
IPS	Im-Persiaran-Shin
LDCs	Less Developed Countries
LF	Labour Force
LLC	Levine-Lin-Chu test
Ln	Logarithm
OECD	Organization for Economic Cooperation and Development countries
OLS	Ordinary Least Square
PCI	Per Capita Income
REX	Real Exchange Rate
RGDP	Real Gross Domestic Product
TO	Trade Openness

ABSTRACT

This study examines the impact of globalization and financial market development on the economic growth of some selected West African countries. The study employed 11 countries which include Nigeria, Ghana, Senegal, Mali, Benin, Niger, Côte d'Ivoire, Gambia, Guinea Bissau, Burkina Faso and Sierra Leone. The data spanned from 1978 to 2017 (40 years). The Generalized Method of Moments (GMM) through the fixed and random effects estimation technique was applied in the data analysis. Pre-estimation and post estimation test were also carried out to ascertain the nature of the data and to examine the robustness of the regression result. The results shows that the lag value of real GDP, stock of physical capital, labour force and globalization has a positive impact on economic growth while financial market development and inflation shows negative impact on economic growth of the region. Also, financial market development has insignificant relationship with investment whereas per capital income, labour force and globalization have a positive relationship with investment while real exchange rate and inflation shows a negative relationship with investment. the result also shows that globalization have insignificant relationship with financial market development, and financial market development, interest rate, inflation rate, real exchange rate and real GDP shows a positive and significant relationship with per capita income of the region. Hence, the study concludes that globalization and financial market development, if well harnessed, have the possibilities of increasing the economic growth of West Africa in the long-run.

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Global rate of convergence has been on the increase through capital formation and financial capital globalization. This globalization can be said to be from time immemorial, but its waves became popularized through the economies of bullionism (Boettke, 2015). The first globalization wave – which died with the Great Depression – witnessed a substantial increase in both output and financial interconnectedness (Christodoulakis, 2015). Trade openness, which was given as the ratio of import plus export to gross domestic product (GDP), in the world leading economies – European countries – grew rapidly in the 1800s (Fagan, 2002; James and James, 2008; Antràs and Yeaple, 2014). In this period, the financial openness measured as the ratio of investment assets held by foreigners to GDP, also experienced dramatic increase as more capital flows across colonies. Hence, globalization and financial market development interplays.

The linkage between economic growth and financial development/integration can be traced theoretically to the work of Bagehot (1873) and Schumpeter (1912). Other empirical work of Goldsmith (1969), McKinnon (1973) and Shaw (1973) largely contributed to the development of the relationship between economic growth and financial development.

Albro et al (1990) define globalization as the process of international economic integration which results from the interplay of products, ideas and views, and other aspects of culture. Todaro and Smith (2011), sees globalization as a process through which world economies becomes unified and integrated, which result to Global Economic Policymaking. Globalization in this context requires the liberalization of the domestic capital and the financial sector. Financial liberalization precedes financial integration. Financial integration takes place, when a liberalized economy experienced an active participation of local investors (borrowers and lender) in the global financial markets, or when a liberalized economy witnesses an increase in cross-border capital movement, as well as when there is a high use of domestic and foreign financial intermediaries. Though developed countries are the major participants in financial globalization wave in the 18th

and early 19th centuries, developing countries are now taking an active role in globalization (Sergio; 2004).

Historically, globalization is not a recent phenomenon. Capital flow has been an aged long event. Prior to the First World War, only a few countries engaged in capital flow which was used to aid international trade. In this period, capital flows was in form of bonds with long-term maturity. International investment and financial intermediation were basically carried out by few numbers of free-trading companies and groups, as an international currency was denominated by the gold standard, and domestic currency was also backed by gold (Albro , 1990).

The first World War was an episode that blows the wave of financial globalization of different countries but was soon overtook by the menace of macroeconomic instability and crises that ultimately led to the great depression of the 1930's and the second World War (Sergio; 2004).

In the first decades after the Second World War, globalization – fueled by economic integration – mainly took the form of an increase in the volume of international trade. During this period, the Western countries liberalized their international trade regimes through the reduction in tariffs and eliminations of other forms of restriction on imports but placed greater restrictions on capital mobility – both private import and export of capital (Jacobson and Surenson, 2002). One of the motivations behind this policy was that capital restrictions made it easier for government to defend the fixed exchange rate parities – a fixed exchange rate policy adopted under the Britton Wood system – established after the Second World War. The breaking down of the Britton Wood fixed exchange rate system in the 70's breaks the quantitative restrictions on international capital flows, and restriction on domestic credit was seen as increasing inefficiency and harmful to economic efficiency. Today, globalization coupled with unrestricted capital flows and trade liberalization has increased the economic integration of the world at large.

Mundell (2000) attributed the financial liberalization witnessed in the 1970's to the oil price shock and the breakup of the Britton Wood system. He argues that the shock in oil price provide international banks with funds to invest in developing countries. The funds provided by the international banks were in form of syndicated loans, which were used to finance public debt. With the breaking down of the Britton Wood system, countries had the opportunity to engage in capital mobility.

The Mexico 1980's debt crisis was also another great episode that led to the development of the bond markets in emerging – developing – economies. The capital flows of the 1970's and 1980's precede the debt crises of Mexico which stated in 1982. In order to solve this crisis, the Brandy Bonds were created, and this led to the genesis of the development of the bond market in the economic history of the emerging economies. Also following the advancement in technology, privatization and deregulation made an equity investment and foreign direct investment (FDI) in developing/emerging economies more attractive to households' firms, and developed countries. This led to FDI boom in the 1990's and massive flows of the portfolio to developing countries within the same period (Saggi, 1999).

In West African countries, countries like Ghana, Nigeria, and Niger had the record of being in the ranked of earliest globalized countries in the region. Globalization in Ghana started in 1983. During this period, Ghana's economy witnessed a stable economic growth with an annual growth rate of 4%, which is relatively higher than the 2.9% average GDP growth rate in sub-Saharan African countries. The globalization experience also made Ghana a model for free-market innovation in Africa in the 1990's. Foreign direct investment in Ghana moved from $2.8 in 1980 to $15 million in 1990 and further increased to $244 million $2 billion and $3 billion in 2000, 2010 and 2017 respectively. This indicates that globalization has increased the flow of foreign investment in Ghana. This undoubtedly led to a reduction in Ghana's poverty rate from 50% before the globalization to 40% after globalization (Cletus and Godwin, 2015).

Table 1.1: Globalization, financial market and economic growth indicators

Countries / Year		Percentage of credit to the private sector	GDP growth	FDI
GHN	1980	26.57821	3.9972	2.8
	1990	21.22763	3.3288	15.0
	2000	32.52292	5.284	243.7
	2010	30.70035	7.8997	2372.5
	2017	34.00148	22.884	3485.3
NIG	1980	20.25867	4.2048	309.6
	1990	20.14459	10.1358	1884.2
	2000	19.08104	5.3181	1004.9

	2010	37.10522	-0.91303	8554.8
	2017	26.55513	-0.9999	4434.6
NIGER	1980	12.90738	-8.735	0.046
	1990	16.44843	-1.284	0.762
	2000	9.387011	6.1214	276.1
	2010	12.07679	8.3692	631.000
	2017	18.36645	2.84467	293.000

Source: Researcher's computation using data from WDI (2017)

More so, the wave of globalization hit the Nigeria economy in 1986 with the Structural Adjustment Program (SAP). This program aimed at increasing the productivity level of the country by promoting investment. In Nigeria despite institutional weakness and hesitancy in policy formation and implantation, there had been an improvement in the trade and investment after the SAP program. Foreign direct investment in Nigeria in 1980 was $310 million. Ten years later, the value of FDI has increased to $1.9 billion. This value slightly decreased to $1 billion in 2000 but rose to $8.6 billion in 2010. As at 2017, FDI in Nigeria was approximately $4.4 billion. It can be clearly seen that the impact of trade liberalization actually improve the GDP growth rate from 4% to 10% in 1990. The GDP growth rate through the 1990 to early 2000 was average 5% annually. Though due to recession, GDP growth rate declined in the recent years as presented in the table below. One of the impacts of globalization on Nigerian economy in early 1990's was the reduction in tariff rate and the country's reliance on import quotas (World Bank, 2010).

The Republic Niger also embarked on globalization move in 1983 which was initiated to improve the economy through the reduction in the numbers of government employees, liberalization of commerce and banking sector and a reduction in subsidies and price control. Niger Republic is another epitome of globalization in West African Countries as FDI in 1980 was $46 thousand dollar. The globalization experience of the 1980's increased FDI to $762 thousand and further to $276 million in 2000. FDI thereafter rose to $631 million and $293 million in 2010 and 2017 respectively. Growth rate in GDP in Niger has improved drastically as a result of globalization. It can be seen clearly that in 1980, GDP growth was -8.7%. Introduction of liberalized economy reduced this downward trend in GDP growth to -1% in 1990 and ever since then, Niger Republic had maintained a positive growth rate(Souley, 2012).

The financial sector controls the flows liquid asset of every economy; therefore, it is regarded as an important aspect of every economy. The sector also comprises of the foreign exchange market which regulates the rate at which a country's currency will be exchanged for another and hence determines the international competitiveness of such countries. The impact of globalization on this sector has therefore been seen in the case of foreign-owned institutions within the country (Omojolaibi et al, 2016). Though financial development was also accompanied with financial crisis, Levine (2005) and Ang (2008) argued that globalization promotes financial development and enhances productivity because it allows for better performance of the financial system and its basic functions. They also argued that financial globalization promotes economic growth indirectly by influencing savings and investment. It has also been argued that in order to maximize the benefit of globalization, the policy that promotes financial sector development, trade openness, institutional quality must be instituted (Kose, 2010).

From table 1.1 above, we can clearly observe the trend in financial market development – as proxy by total credit to the private sector. The percentage of total credit to the private sector in Ghana as dated back to 1980 was 27%. This value slightly reduced to 21% in 1990. But the financial liberalization of the 1980's in this country could have said to be of utmost reason for the growth in this percentage from 21% in 1990 to 32% in 2000. As at 2017, total credit to the private sector had increased to 34%.

In Nigeria, total credit to the private sector as at 1980 was 20%. This variable maintains the same average in 1990 but experienced a little decline to 19% in 2000. It experience a rise to 37% in 2010 but experience a decline to 27 percent in 2017 probably due to economic recession experienced in this period.

In Niger republic, financial market development indicator has improved in the recent years. In 1980, total credit to the private sector in 1980 was 12%. This value increased to 16% in 1990 after the SAP program but thereafter, the variable experience a decline due to long period of recession in Niger. Hence, the indicator for financial market development in West Africa has shown that financial market development has improved overtime.

Historical, it has been noted that globalization has increased the focal point of world trade flows by sixteen-fold (Ajayi, 2001). Output growth of some countries had been sustained through

globalization and the harmonious working of some sectors in the economy like the telecommunication sector, oil and gas sector, agricultural sector, etc. This, in turn, has increased global capital flow and investment (Omojolaibi, 2016). The growth in globalization recently has also shown that some major activities like banking, entertainment, manufacturing, education, communication networks etc, are currently being carried out through globalization of Information and Communication Technology (ICT). The advent of ICT has made it possible for West African countries to participate in the global economy which also promotes these countries access to innovations and technology. The resulting impact of globalization in this respect is worth noting. In the education sector, for instance, the advents of ICT have brought tremendous revolution in the educational sector, which has helped in boosting the performance of the whole economy by providing more professionals like Doctors, Engineers, Layers etc. globalization has in expand the trade aspect as Nigeria even emerge as the 6^{th} largest exporter of crude oil in the world.

Globalization and its resulting effects can, therefore, be said to have brought a diverse economic, social and political changes in the world system. It has also been noticed that the resulting consequences of globalization depend on the level of economic integration of the country in relation to the global economy (Koc., 2013). Some industrialized countries like China, India, Japan, etc. benefited most from globalization as the level of their productivity increased drastically within the globalization period. This, therefore, made Stiglitz (2002) conclude that globalization enhances productivities, investment and aggregate demand of a country. But a high degree of integration to him tends to be hazardous to the stability of the capital market and also leads to a weak financial system in less developed countries. This is what is regarded as the asymmetric relationship between economic productivity and financial market (Yildirim et al., 2013).

1.2 Statement of Problem

Globalization during the 19thand early 20th century – before the First World War – to Bordo et al (2003), was characterized by massive expansion in international trade, international financial integration and high rate of international migration. Many countries during this period undergo financial revolution, and the currently developed countries were still in their developing state then (Sylla and Rousseau, 2013).

West African countries in their quest to reap the benefits of globalization and economic integration, engaged in the deregulation of their domestic economy, with several reforms program and policy adjustment (Asongu, 2013a; Janine and Elbadawi, 1992). The first episode of these reforms aimed at removing the excess restrictions on the price of credit, to allow the prevalence of market-determined allowance of interest rates, removal of excess controls on capital flows (Asongu, 2013b). The second episode focusing on the structural and institutional constraint which include the rehabilitation of financial infrastructure, restoring bank soundness, and enhancing legal, institutional and supervisory environment (Batuo et al., 2010; Simplice et al., 2015; Bautuo and Asongu, 2015).

Unfortunately, despite the noticeable structural adjustment programs, and the decades of globalization and the financial sector liberalization in West Africa, the economy of this region still lie undeveloped as no remarkable progress can be shown in terms of productivity, growth, and development (Fouda, 2009; Asongu, 2014a; Saxegaard, 2006). The financial system of West African countries, even after several reforms, had not been fully integrated with the World financial system, as the capital market still witnesses persistence high rate of segmentation, high level of correlation between domestic saving and investment, country-specific bias and the financial market development indicators of this region had been undergoing a season of shock over time (Rioja and Valev, 2004).

Financial instability in developing countries and most West African countries had been associated with serious issues in the financial sector. These issues had been relatively large in terms of weak public confidence in the financial markets and inefficient financial intermediation, posing a great threat to savings and investment locally and the inflows of capital (Kama, 2009). Instability of financial system could be damaging to the economy, through a high interest rate. Hence, financial instability couples with financial intermediation inefficiency, which result from the banking crisis, not only pose a barrier to savings and investment, but also to consumption expenditure. This is because it limits the amount of credit that goes to households for the purchase of durable goods (Dama, Gropp and Mordel, 2014).

Nigeria, the supposed ‘largest economy in West Africa’, in addition to SAP, adopt various developmental financial schemes, introduced by the Central Bank of Nigeria (CBN) to specifically address problems of quick access to credit. These measures which include

Agricultural Credit Guarantee Scheme Fund (ACGS) in 1987, Interest rate drawback programme, in 2002, the Commercial Agricultural Credit Scheme (CACS), Small and Medium Enterprises Equity Investment Scheme (SMEIS) in 2001, and Microfinance policy in 2004. Also, in 2010, the CBN injected N500 billion into the economy as a special intervention fund under a quantitative easing program to ensure the flow of liquidity to the real sector of the economy at a reasonable interest rate. In 2015, the CBN introduced the Nigeria Incentive-Based Risk Sharing System to de-risked lending to the agricultural sector These measures were complemented by interventions to manage interbank liquidity and the use of Treasury securities (Tule et al, 2015).

As argued by Jibrina and Ejura (2014), in spite of the policy measures put in place to boost the performance of the financial sector, the phenomenon of financial market underdevelopment still persist in Nigeria and other West African countries, as reflected in the complaints of the manufacturers, industrialists, and small and medium-sized enterprises (SME's) operators who consistently identify high lending rate, unstable stock exchange market, among others as key factors that contributed to unfavourable investment climate in the region. A strong financial system and financial intermediaries are still not in place, as most people still do not have access to commercial bank credits (Umejiaku, 2011).

Furthermore, the impact of globalization on the economy as predicted by Heckscher-Ohlin theory should be an improvement in the productive capacity of a country. Increase in productivity in turn should lead to reduction in poverty and income redistribution (Rodrik, 1999, Reddy and Pogge, 2002; Collier and Dollar, 2002; Rodriguez and Milanovic 2002b). Therefore, with the expected impact of globalization and financial liberalization on income, one would expect a reduction in poverty as income increases. Indeed, some fast-growing globalized economy like India, China, Vietnam etc experienced a decrease in poverty as the majority of their population lives above the poverty line. But such result is contrary in West African countries, as many of her globalized countries still have more than half of its population living below poverty line. Even the claim by researchers that globalization can lead to a reduction in inequality (Sala-i-Martin, 2002), cannot be proved with confidence in West Africa where both absolute and relative poverty (inequality) is of the high increase in most of its countries (Reddy and Pogge, 2002; Milanovic 2002b).

West African countries have strategies various way to promote financial market development and output growth. But all these measures have not yield their desired result probably because of weal institutional system as argued by Sylla and Rousseau (2003). Micheal and Christopher, (2015) also argued that developed countries that experienced rapid growth after financial revolution had strong financial system, characterized with sound public debt management and finance, stable monetary policy and regime, a workable central bank, and a well-functioning securities markets. Unfortunately, virtually all West African countries lack most of these workable financial institutions that can help in reaping the benefits of globalization. Most West African country's financial institutions are subject to erratic shock from the international policy change. The banking system had been marked with the high level of inefficiency, corruption, and failure to safeguard financial investment. Public finance and public debt management have become a huge problem in overtime. This makes the benefit of West African countries from globalization questionable as the region is associated with the weak financial institution, hence, the motivation for this topic.

1.3 Research Questions

Based on the above-identified problems, this research posed the following questions which could act as a guide in the understanding of globalization, financial development and output sustainability in West African countries. They are as follows:

1. Does financial market development have impact on economic growth of West African countries?
2. Does financial market development have impact on private sector investment in West African Countries?
3. Does globalization has the impact on financial market development in West African countries?
4. Does globalization has impact on per capita income in West African countries?

1.4 Objective of the Study

Based on the above research questions, the researcher in order to adequately and effectively answer the questions divide the objective into broad objective and subsidiary or specific

objectives. The broad objective of the study is to examine globalization, financial development and output sustainability of West African countries. The specific objectives on the other hand are:

1. To examine the impact of financial market development on economic growth of West African countries.
2. To ascertain the impact of financial market development on private sector investment in West African Countries.
3. To examine the impact of globalization on financial market development in West African countries.
4. To examine the impact of globalization on per capita income in West African countries.

1.5 Research Hypotheses

For statistical and analytical reasons, the following hypothesis will act as a roadmap to the above questions

H_{O1}: Financial market development has no significant impact on Gross Domestic Product of West African countries.

H_{02}: Financial market development has no significant impact on private sector Development in West African countries.

H_{O3}: Globalization has no significant impact on financial market development in West African countries.

H_{o4}: Globalization has no significant impact on per capita income in West African countries

1.6 Significance of the Study

This study investigates the current position of globalization, financial development and output sustainability of West African countries. This work will be of immense benefit to the federal government of these countries, and other developing countries on the direction of policy formulation on financial market variables such interest rate, exchange rate etc. that will generate

a sustainable impact of globalization and financial market development on the domestic economy. The globalization and financial target of this study will also help the government to formulate a good policy that will enhance the efficiency of small and medium scale enterprises that ease the access loans facilities. Globalization study in West Africa will provide information to the government on the need for the provision of enabling environment which will help to boost the level of savings and investment in West African countries.

This investigation will also serve as stepping stones for future researchers who develop an interest in the study of globalization and financial development all over the world.

Finally, the student will find this piece highly relevant as it will undeniably increase their knowledge and horizon on the concept of globalization, financial market development, and output sustainability. The education sector is also considered as one of the significant beneficiaries because it is believed that this research will serve as a reference point to future researchers in this subject matter. Above all, it will add to existing stock of knowledge, thereby filling up the knowledge gap.

1.7 Scope of the Study

This present study will be done and restricted to West African countries alone and will be examined from 1978 – 2017. The choice of this period is informed by data availability. The study employs panel analysis of 11 countries in the region which include Nigeria, Ghana, Senegal, Mali, Benin, Niger, Cote devoir, Gambia, Guinea Bissau, Burkina Faso and Sierra Leone. The data also spanned from 1977 to 2016 (40 years). The variables to be employed are globalization (trade openness and FDI), financial market development (proxy by total credit to the private sector as percentage of GDP), gross domestic product (GDP), Manufacturing output share to GDP, and other control variables such as interest rate and exchange rate. These variables are selected based on the underlying theories available on the subject.

1.8 Structure of the study

The study is organized into five chapters. Chapter one provides the introductory aspect which covers Background of the study, statement of problem, the research objectives, questions and Hypothesis, significance of study and the scope. Chapter two focuses on the conceptual framework, Theoretical and Empirical literature. Chapter three covers the research methodology

while chapter four deals with the presentation of estimation results and discussion of findings. The research work will be rounded up in chapter five with the summary of findings, conclusions and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Literature review gives the underground information about the subject under considerations. The literature will help us in ascertaining the theories as well as the empirical findings of various authors, the points of convergence and divergence, and also help us in knowing the gap in literature to prevent duplications of efforts. This related literature can be obtained from published journals, articles, books, magazines, unpublished write-up by other researchers etc. This chapter is divided into the conceptual framework, theoretical framework, theoretical literature, empirical literature, summary, and value added to the research.

2.2 Conceptual Framework

2.2.1 Concept of Globalization

Globalization is the spread of products, technology, information, and jobs across national borders and cultures. In economic terms, it describes an interdependence of nations around the globe fostered through free trade. On the upside, it can raise the standard of living in poor and less developed countries by providing job opportunity, modernization, and improved access to goods and services. On the downside, it can destroy job opportunities in more developed and high-wage countries as the production of goods moves across borders.

Globalization motives are idealistic, as well as opportunistic, but the development of a global free market has benefited large corporations based in the Western world. Its impact remains mixed for workers, cultures, and small businesses around the globe, in both developed and emerging nations. This will be captured with a proxy, trade openness.

The potential advantages of globalization and financial development had been evidence in the analysis of the mainstream economists' overtime. They posit that the international open financial system tends to be more competitive over the long run, more efficient in resources allocation and more and more transparent (Duarte and Obstfeld, 2008). They argued that global scale efficient

allocation of resources hinges on free capital mobility. Despite this general view, it has been noted that economic growth rate in the last 30 years was found to be smaller than its growth rate in the last 1960s and 1970s. Canh (2016) did not find such evidence of an increase in economic growth resulting from an increase in capital inflows. They also noted that one predominant characteristic of globalization is financial uncertainty.

Developing countries economy are mostly subject to the financial crisis, for example, the financial crisis witnessed in Mexico in 1994-1995, Brazil 1998-1999, Argentina in 2000-2001, Nigeria 2007-2009, Europe 20011. The financial crisis experienced by these countries is a signal of the infection that accompanies financial globalization. Though, Bekaert, Harvey and Lundblad (2005), Eichengreen and Leblang (2003) and Bailliu (2000), argued that a country will reap the benefits of financial globalization when such country has established or adopt a strong financial system. They conclude that when a country has a strong financial system, the financial crisis will be of minimal, as the allocation of capital become more efficient.

2.2.2 Concept of Financial Development

Financial development is the process of financial innovations, and the improvements in the organizational and institutional framework of the financial system (Hartmann et al, 2007). Financial development reduces the complexity of the financial system by reducing information asymmetric, reducing transaction cost, increases competition and increasing the contracting possibilities and completeness of markets. The channel through which financial integration can influence financial development is through competition with lower-cost foreign intermediaries (Jappelli and Pagano, 2008). International financial competitiveness put downward pressure on financial cost for counties with the less developed financial system, hereby expanding the domestic financial markets. The link between financial development and integration is of great economic importance, as more evidence linked financial market development to economic growth (Baele et al, 2004). The financial development is proxy by the ratio of bank credit to the private sector (as used by other researchers like Sjöholm, (1999); Verdolini and Galeotti (2011).

Levine (1997) argued that financial development promotes economic growth by mobilizing savings for investment, allocating resources, and reducing uncertainty through investment diversification and pooling of risk. Though Levine (1997) found a positive relationship between

financial market development and economic growth, he was careful not to conclude on the causal relationship. To Trichet (2005), financial integration precedes financial development and financial developments stimulate economic growth. Financial integration propels the realization of economies of scale and increases investment funds. Integration also stimulates competition and the expansion of financial markets which leads to development. Financial development then leads to efficient allocation of resources (capital) as well as the reduction in capital cost (Stavarek et al., 2011).

2.2.3 Concept of Output Sustainability

Output growth has been defined as the increase in the productive capacity of a country over time. Economic growth is often measured as the growth of financial transaction of an economy. Money is often used to capture economic value, used in exchange for goods and services. For the purpose of this work, output sustainability will be proxy by Real Gross Domestic Product.

Output sustainability goes beyond the increase in economy's output. It implies the production system that satisfies the needs of the present without compromising the needs of the future. Output sustainable originated from the work of Hicks (1946) in his famous work on value and capital. Hicks defined ‘income' as "the amount one can consume during a period and still be as well of at the end of the period". The traditional economists advocate market efficient allocation of resources, by assuming that the supply of resources was limited. They also believed that economic growth will facilitate innovations and technological development which will replenish the destroyed natural resources exhausted during the production process (Basiago, 1999).

2.2 Theoretical Literature

2.2.1 Theories of Globalization in Trade and Finance

Absolute Cost Advantage – Adam Smith

The Absolute Cost Advantage (ACA) focused on trade globalization as a function of a country's concentration on the production of goods and services in which they have a relatively higher advantage than other countries. Smith assumed that each country can at least produce one

commodity at least cost than its trading partners. Globalization in this context involves inter-countries output movement of goods and services at which the producing countries have a higher advantage over others. The advantage in this context means that the country has a least real cost in term of labour per hour in the production of such goods.

The theory of course centered on the labor theory of value, which treat labor as the only factors of production, and holds that the numbers of hours required in the production of a good determine its equivalent value of exchange. Countries will, therefore, produce those goods in which they have a relatively low-cost advantage than other countries both for domestic consumption and international export, and import those goods and services in which other countries have the least cost. The importance of this theory is to foster countries gain from globalization through interrelationship between output movement and global market. It also focused on the needs to promote global productivity and the development of different sectors of each country as specialization will promote employment opportunities and income.

Comparative Cost Advantage Theory – David Ricardo

David Ricardo objects the theory of absolute cost advantage as the condition for countries to engage in international trade. He is of the opinion that it is possible for a country to have an absolute cost advantage over another country in the production of say two goods. This means that the second country will not benefit from international trade, but leave the country that has the absolute advantage over the production of the two goods. To him, the trade will benefit the two countries if the ratio of their real costs in terms of labor inputs is different for two or more commodities. Trade, therefore, depends on their comparative advantage, and two nations can engage in trade even though the real cost of production – in terms of labor – is more advantageous to one country than the other.

Opportunity Cost Theory – Haberler

Haberler (1936) explains the theory of international trade of comparative cost advantage on the opportunity cost theory. Opportunity cost theory posits that the cost of a commodity is the amount of another commodity that must be given up to produce one additional unit of the first commodity. Here, countries with a lower opportunity cost in the production of a commodity have

a comparative advantage in the production of such commodity and a comparative disadvantage in the production of the second commodity.

Factor Proportion Theory – Hecksher-Ohlin Theory

Heckscher-Ohlin model improves on the classical theory of trade globalization – the absolute cost advantage of Adam Smith. To them, globalization could benefit every country when each country specializes in the production of goods and services – for the domestic and international market – where they have abundance factors of production. Each country should import those goods and services on which they have scarce resources/factors of production. This will promote world. In other words, specialization will increase output by increasing varieties of goods in the international market. The model did not take into account of the current exchange rate regime

The Porter's Theory

Porter's theory became relevant in international trade because it focused on the fact that there should be a strategically means of comparing domestic and international firms in terms of their competitiveness in order to promote the domestic firms' competitive advantage. The theory posits that integration of a country with international economy brings both positive and negative effects on the domestic economy and therefore, any country that integrate must develop a means to absorb the negative tendencies emanating from such integration.

The basis of this theory is the system of determinants, which comprises the factors inputs and the endowment of a nation. Factors such as the change in government policy influence these determinants, and the determinants are depending on one other. Porter posits that economic resources are best utilized when the resources are used in the most preferable economic interest. The dynamics and complexity of a countries economy, the more likely is for some industries to fail if they cannot capitalize in a productive way to fit into the environment. Therefore, Porter outlines four factors of production as natural resources, human resources, infrastructure and capital resources, and knowledge resources. The porter's theory, therefore, creates the wave for both commercial and industrial policy purposes.

Portfolio Effects Theory

The portfolio effect theory was developed in the field of finance. It was developed by Harry Markowitz (1952, 1959), Tobin (1958), Sharpe (1963), Linter (1965), and Mossin (1966), among others. Neto and Vasconcellos (1987) maintained that there are two kinds of literature in portfolio theory approach to trade in export, these are macroeconomic view generally associated with the economic development theorist and microfinance view development theorist and micro-finance view developed by finance theorist.

The conventional macroeconomic wisdom accepted the view that the concentration of LDC's exports on a few commodities was a major contributing factor to the excessive short-term fluctuations observed in her export earnings. The arguments about concentration and earnings instability can be summarised as the more highly concentrated a country's export is, the lower the probability that fluctuations in one direction in some of its exports will be offset by counter-fluctuations or stability in others.

In micro-finance view, financial theorists developed rigorously the platform of portfolio theory and the capital asset pricing model (CAPM). The idea is that the different products which comprise the exports of a given country are treated as a portfolio of earning assets. The major assumption of the theory is based on selecting a group of assets with lower collective risk in finance. A portfolio constitutes an appropriate combination or set of investments. The appropriateness of the mix of investments depends on the mix-expected return and its variance expressed by the standard deviation. The higher the portfolio gains, the higher are its expected return and the lower the standard deviation of return. It is therefore imperative that to maximized the impact of globalization, combinations of assets both domestic and international should be encouraged as this will reduce the portfolio's standard deviation and hence the variance.

2.2.2 Theories of Economic Growth

Economic growth can be defined as the positive change in the productive capacity in the production of goods and services of a country over time. Economic growth is the increase in the monetary value of a country's output of goods and services of a country over a certain period of time. In another world, economic growth can be referred to as the increase in the gross domestic product of a country over a specific period of time. Several theories had been proposed overtime

as being a major driven force of economic growth. In this section, we will consider some of the theories for a better understanding of the major elements of growth.

The Classical Theory of Economic Growth

The classical theory of growth assigns to the rate of investment the responsibility for fostering growth, itself a function of the share of profits in national income. A positive relationship between both variables is deemed to exist hence higher rates of profit are deemed to result in higher rates of growth through its positive effect on the rate of investment.

The major exponents of this theory are Adam Smith, David Ricardo, and J.S Mill. In this theory, they argued that the increased division of labor and hence specialization made possible the increases in the growth rate of capital would result in increases in both profit and wages. Furthermore, an increase in profit and wages would, in turn, offset population expansion which is the course of growth of capital and labor overtime would result in diminishing return consequent upon the fixity of land. The setting in of diminishing returns will lead to a decline in profits while also bringing about the return of wages to subsistence level, leading in return to a decline in investment and hence growth, thus bringing about a return of the economy to a stationary state. In sum, the classical theory assigns to the rate of investment as the major force that fosters economic growth, which is a function of the share of profit in the national income. The classical theory also specifies a positive relationship between investment and economic growth.

The Marxian Theory of Growth

The Marxian theory of growth is one of the historical theories of growth in admixture of reasoning proceeding from economics and sociological aspect/perspectives. The theory based economic growth on the transformation of the society from an agrarian economy to modern economy. It views the process of growth as the process of transformation of a society's social cultural and political life. Such transformation can be traced to the society's mode of production as well as property rights of the society's economic power and prestige seeking class. Therefore, the Marxian growth theory viewed growth as a function of the rate of accumulation of labor

surplus value being the rate of profit in excess of labor's true remuneration which has been exploited from workers by factor owners (the capitalists)

Keynesian Growth Theory

Keynesian growth theory is an extension of Roy F. Harrod (1939) and E. Domar (1946). These neo-Keynesian economists examine independently the dynamics of Keynesian theory. The theory is based on the role of money, the principle of effective demand and on the saving function, the transition of savings into investment, government intervention to generate effective demand, and the multipliers effect. To Keynes, economic growth emerged when there is an effective demand in the economy. To him, the government intervention will create more income in the hands of the people which they can use in purchasing goods and services. Firms, on the other hand, will respond to this increase in demand by supplying more goods, and in other to supply more goods, they employ new workers. This set of new workers employed too now has disposable income which they will be willing to spend on purchasing goods and the process continued. The extent of this effect, in the long run, is known as the multiplier's effect which depends on the marginal propensity to consume.

The Neo-Classical Growth Theory of Solow-Swan Model

The neoclassical theory assumes three variables namely: output (Y), capital (K) and labor (L). The output is assumed to be a function of two factors of production, K and L. They further assume a constant return to scale and that there are diminishing returns to capital and labor as the factors increases. Form the above assumptions; the classical therefore postulates that increasing capital relative to labor creates economic growth since people can be more productive given more capital (i.e increase in capital per labor). More also, they opined that poor countries with less capital per labor will grow faster because each investment in capital will produce higher returns than countries with high capital accumulation. This is because those countries with high capital accumulations will have higher break-even investment (i.e the investment that will be needed to keep the capital stock from falling). Lastly, because of diminishing returns to capital,

economies will eventually reach a point at which any increase in capital will no longer create economic growth. This is a steady state. They also note that countries can outpace this steady state through growth in new technology.

The Endogenous Growth Model

The endogenous growth theory was developed as a reaction to omission and deficiencies in the Solow-Swan neoclassical growth theory. It is a growth theory which explains the long-run growth rate of an economy on the bases of endogenous factors as against the exogenous factor of the neoclassical growth theory. The Solow-Swan neoclassical growth theory explains the long-run growth rate of output based on two exogenous variables: the rate of population growth and the rate of technological progress which is independent of savings rate (Jhigan, 2010)

The endogenous growth gives great attention to the place of technology advancement by developing the mathematical explanation of growth as depending on technological advancement. The model also incorporates a new concept of human capital, the skills, and knowledge that makes workers productive. Unlike the physical capital, the human capital has increasing rates of return. Therefore, there are constant returns to capital, and the economies never reached a steady state. Growth does not slow as capital accumulates, but the rate of growth depends on the types of capital a country invests in. Research is done in this area focused on what increases human capital like education, or technological change like innovation.

2.3 Empirical Literature

Foreign Literature

King and Levine (1993) in their cross-country panel data analysis provide evidence on the significant relationship between financial market growth and the growth in economic output, this they interpreted as causal. Demetriades and Hussein (1996), however, present an opposite view to the earlier findings of King and Levine. With panel evidence from time series analysis of 16 LDC's, they found that financial market development (banks in this case) does not always

Granger cause economic growth. They found that the causality is a reversal, meaning, it is economic growth that Granger-cause financial market and not vice versa. This, therefore, advocate for caution in the interpretation of the relationship between financial development and economic growth.

Follow-up research of Rioja and Valev (2004), Demetriades and Law (2006) observed that financial market development influences growth only when the financial system is operated within the context of the strong institutional framework. It was also observed that the impact of financial development on economic growth is mostly felt by the middle-income countries, and weak when for the low-income countries. Therefore, the relationship between financial development and economic growth tends to be sensitive not only to the state of the economy and financial development but also to the development of the institutional framework in the country. Institutional quality has been found to influence the causal relationship between financial market and economic growth even within the same income group. This, therefore, cast the doubt of whether financial development can really influence economic growth especially in LDC's where institutional framework tends to be weak.

Edgar (2012) study the impact of financial globalization on financial development in transition countries by adopting the theoretical framework of Blundell and Bond (1998). The result shows that financial globalization has a positive and significant relationship with growth in the financial system, but not with the process of development. That is financial globalization enhances the performance of the financial system.

Altuğ and Görkemli (2016) employed dynamic OLS method in their works on globalization, financial development, and economic growth, classifying countries according to their income levels (High-income countries, Upper middle-income countries, Lower middle-income countries, and low-income countries) with data from 1980-2010. Their result shows that there exists a long-run relationship between financial development and economic growth as well as other key macroeconomic growth variables. The result also shows that effective policy applications differ in relative to the classified income group.

Frederic (2007) in his work on globalization and financial development, argued that institutional reforms in the developing countries, financial development and growth are only stimulated

though globalization. He opined that the advanced countries help in facilitating this process by supporting the opening of the market for goods and services from developing countries. This process will also encourage these countries to increase their participation in globally, as the advanced countries initiate and implement strategic reforms that will foster high economic growth in the developing countries.

Mishkin (2009) examine the impact of globalization on financial development in the developing countries, through panel data analysis. The result revealed that globalization plays a prominent role in enhancing institutional reforms in LDC's with well-developed financial structure and growth. The study also posits that the developed countries can assist the promotion of financial development and economic growth by removing the excess restriction on LDC's export.

Garcia (2012) on his analysis of the nexus between financial globalization and financial development in transition economies, observed that globalization of the financial system positively impacts the growth process of the financial system in the countries under considerations. However, there were no such shreds of evidence when the overall development process of the financial system was examined. This, therefore, suggest that globalization of the financial system did no result into a better economic performance of the financial system in these transition countries.

De Nicolo and Juvenal (2014) in their study of the effects of financial integration and globalization in enhancing real economic activities in some emerging and advanced economy from 1985 – 2008, using a dynamic panel data analysis, with emphasis on three dimensions of macroeconomic targeting, – macroeconomic stability, economic growth, and growth volatility – found that financial integration and globalization are associated lower possibilities of decline in real economic activities, higher growth with lower volatility. Therefore, the finding does not find any evidence in the trade-off between globalization, financial integration, and macroeconomic stability.

Simplice and Vanessa (2015) study the role of financial globalization in financial allocation efficiency using four countries of Africa from 1980 – 2008. Using financial and the banking system efficiency as the dependent variables, the researchers found that efficient allocation of financial resources is sensitive to globalization but more sensitive to trade openness. The

relationship between allocation efficiency and globalization is found to follow a decrease in returns to allocation efficiency from globalization.

Sergio (2004) examines the benefit and risks of financial globalization and the challenges for developing countries. He found out that financial globalization can lead to huge benefits especially in the development of the financial sector. But he also observed that financial globalization also come with its own side effect. Though comparing the net effect of globalization, it is likely to be positive in the long run. The side effect prevails after a country has liberalized. He concluded that only some few countries and sectors have actually taken the advantage of globalization.

Michael and Christopher (2015) in order to investigate the reason why some countries grow to a state of financial stability and others do not lead to the examining of financial globalization, financial development and financial crisis in the golden age. The analysis was carried out by dividing the sample into three groups which are the leaders, the learners, and the non-learners. Each group corresponds to their experience in terms of economic outcomes over the long-run, financial stability, financial development, crisis frequency and the policy response to the identified crises. They found a high correlation between financial stability and rule of law, political stability, democracy and other institutional structure that made up a strong institution.

Basco (2014) formulate an empirical model in examining the relationship between globalization and financial market development. He observed that globalization increases the likelihood for financially developed countries to have strong financial system also increased.

Sergio (2013) in his analysis of the gain and pain in developing countries from financial globalization, he discovered that financial globalization benefited the developing countries through the development of the financial system. On the other hand, financial globalization was also seen as been inherent with contagion and can lead to financial crises. The net effect of this is predicted to be positive, and the risk can be felt when the country liberalized.

Some researcher had also investigated the impact of globalization on employment creation, some of their findings will be discussed as well.

Matusz and Tarr (1999) examine the impact of globalization on employment in developing countries using data before 1995. The aim of the researchers was to examine the relationship between globalization and trade before and after trade liberalization in the selected countries. The result shows that foreign direct investment and trade liberalization impact positively on employment generation except in the transition countries of Eastern Europe.

Ghose (2000) examine the relationship between trade liberalization and manufacturing employment. He observed that growth in trade and foreign direct investment is relevant to the newly industrialized countries, and for these countries, the growth in trade of the manufactured product has increased the employment generation in those countries.

Some basic theory of international trade – like the Heckscher-Ohlin theory – had been rejected by the empirical work of Lee and Vivarelli (2004). In their study of "Understanding Globalization, Employment, and Poverty Reduction", they conclude that the impact of foreign direct investment and trade is not a clear cut – it is sector and country-specific. Follow-up research of Lee (2004) also lead him to conclude that despite the clear evidence that most developing countries experience growth in output and employment as a result of globalization, the result should not be generalized that globalization always promote employment, as different nations have different absorptive capacity, institutional framework, different manpower and skills, competitiveness of domestic firms and technological capability difference.

Ghose (2004) in his work "trade liberalization and manufacturing employment" observed that globalization leads to increase in labor productivity and value-added. Hence, the impact of globalization on employment cannot be predicted a priori. The result that supported a positive relationship between globalization and employment generation mostly happen to be within the developing countries, while the non-globalizing developing countries may not witness such because of the lack of improvement in labor productivity.

Spiezia (2004) examine the employment impact of trade on the manufacturing sector. The researcher aims at comparing the employment generation rate between the imported goods, exported goods, and the non-traded goods. With sample drawn from 39 countries, 21 countries result supported that an increase in the trade leads to an increase in employment generation, whereas the remaining 18 countries show that trade reduces employment generation, which

negates the predictions of Heckscher-Ohlin theory. He also found that foreign direct investment increases per-capital income.

Studies from Nigeria

Maduka et, al. (2017) in their study of globalization and economic growth with evidence from Nigeria, employed ARDL econometrical approach through the cointegration and error correction model of Pasaran et al. (2001); with data running from 1970-2015. Their result shows that globalization and economic integration exact a positive significant relationship with economic growth. This led to their conclusion that institutional mechanism that promotes globalization should be encouraged to enhance the desired economic growth.

Feridun et al. (2006) study the effect of globalization on economic growth in Nigeria, employing the cointegration and error correction model, and with data from 1986 – 2013. Their result shows that globalization has a significant positive relationship with economic growth, but financial integration had a non-significant negative relationship with economic growth in Nigeria.

Onwuka and Eguavoen (2007) in their study of globalization and its implications for the growth process of the Nigeria economy employed the descriptive method of chi-squared analysis, and with data from 1985 – 2001. Their result shows that the benefit of Nigeria form globalization is insignificant due to the structure of the economy of mono-cultural export, high debt to output ratio and low foreign direct investment.

Omolade, et al. (2013) examine the nexus between globalization and economic development of Nigeria, using the cointegration and causality analysis, and with data from 1980 – 2011. Their result reveals that globalization exact negative relationship with economic growth. The study also shows that there exists a unidirectional causality from economic development to globalization, and they further show that developed countries benefited more than Nigeria from trade.

Sede and Izilein (2013) investigate the causal effects between economic growth and globalization in Nigeria. Employing the cointegration techniques of Johansen cointegration, causality, and VEC model, the study shows that globalization does not Granger cause economic growth in Nigeria.

This same analysis was carried out by Nwakanma and Ibe (2014) with data from 1981 to 2012. Employing the same methodology adopted by Sede and Izilein, their results also show financial integration does not have a significant impact and globalization. The fixed capital formation was also found to exact a negative non significant relationship with financial integration, but surprisingly, financial integration was still found to Granger cause fixed capital formation.

Okpokpo et al. (2014), studying the interrogated globalization as a potent driver of economic growth in Nigeria focused on the manufacturing and the agricultural sectors' export (non-oil sector) as the base category, and with data from 1970 – 2011. Using the OLS estimation technique, the result shows that globalization has no significant impact on manufacturing and agricultural export and that globalization has no significant impact on Nigerian non-oil export.

Shuaib et al. (2015) in their works on the impact of globalization on the growth of the Nigerian economy from 1960 – 2010, employed the cointegration and error correction model. The result reveals that growth in external debt ratio exacts negative relationship with economic growth in Nigeria.

Utuk (2015) examine the impact of globalization on economic growth in Nigeria with consideration of capital flows and terms of trade from 1970 – 2011. Employing the descriptive statistical analysis, found that increase in capital flow and trade propelled by globalization enhances economic growth and overall economic performance of a country.

Adesoye, Ajike, and Maku (2015) empirically investigate the impact of economic globalization on output growth of the Nigerian economy from 1970 – 2013. Using the Engel-Granger cointegration and ECM, found that increase in inflation, high exchange rate, growth in globalization, increase in FDI and a decrease in interest rate enhances economic growth in Nigeria.

Joseph, Ekundayo, and Nsofor (2016) examine globalization and financial development in Nigeria from 1987 – 2014. In order to examine the channel of globalization in promoting financial sector development adopts the Johansen cointegration test and the Error correction model. the researcher found that globalization has a significant positive relationship with financial market development in Nigeria. The good financial system was attributed to a higher pace of globalization, and it is also seen as a stimulant for the economy.

Loto (2011) in his study of the effect of globalization on Nigeria's growth process employed the Mundell-Fleming model as its basic model. The result shows that Nigerian economy has not benefited from globalization as globalization was found to exact non-significant relationship with economic growth within the study period.

Mobolaji and Ndako (2008) examine the role which globalization plays in Nigeria's financial sector. Using Johansen and ECM estimation technique, the researcher found that globalization enhances economic growth in Nigeria. The researcher, therefore, suggests that for the country to benefit more from globalization there is a need for the establishment of a minimum threshold of development, adequate to promote institutions required.

2.4 Summary of Literature

As stated in the reviewed literature, there has been a lot of controversial arguments overtime on the relationship between financial market development and economic performance. Some researchers found the existence of a positive relationship, like King and Levine (1993), while other researchers like Demetriades and Hussein (1996)present an opposite view to the earlier findings of King and Levine, to posit a financial development does not always Granger cause economic growth. To them, the reversal is the case i.eit is economic growth that Granger-cause financial market and not vice versa.

Some research has also shown that institutional development is the key to reap the benefits of financial globalization (Rioja and Valev, 2004; Demetriades and Law, 2006). To those researchers, globalization and economic growth depend on institutions like a sound property right, policy stability, investment certainty etc. Therefore, the relationship between financial development and economic growth tends to be sensitive not only to the state of the economy and financial development but also to the development of the institutional framework in the country.

It has also been found by Nwakanma and Ibe (2014), Sede and Izilein (2013) that financial integration does not have a significant impact and globalization. The researchers also found that financial development does not have an impact on investment. Okpokpo et al. (2014), in Nigeria, confirmed the findings of Nwakanma and Ibe (2014), Sede and Izilein (2013) in their study. They

observed that globalization and financial development does not impact manufacturing output in Nigeria. Their research does not support the result obtained by Ghose (2004), as he found that globalization and financial development generate employment and promote industrial output.

The result, in a nutshell, is highly contradictory, and no clear-cut ground had been struck in establishing the relationship between financial development and economic growth.

2.5 Limitations of Literature and Value Added

From the reviewed literature so far, there is a great limitation in the study of globalization, financial development and output sustainability.

First, most of the relationships established were centered on the relationship between financial development economic growth and employment generation. They tried to establish why some researchers found a relationship between the two components but pay less attention to other relevant areas like the impact of financial development on private sector investment. The relevance of this current study will help to access other areas, such as the linkage between financial market development and globalization.

Other area that has received fewer attentions in less developed countries is the linkage between financial development, globalization and investment. Most of the works do neglect this area for their peril, as no real impact of globalization and financial development can be observed without it going through investment. There should be a cross-countries analysis of this relationship, most especially the less developed countries which are characterized by high unemployment rate, political and social unrest and the problem of achieving meaningful economic growth in West African countries.

CHAPTER THREE

METHODOLOGY

3.1 Theoretical Framework

The model is a simplified version of the models of R&D and growth developed by P. Romer (1990), Grossman and Helpman (1991a), and Aghion and Howitt (1992). The endogenous growth model attached importance to technological development through research and development in explaining economic growth over time. The model assumes two sectors – the output produced sector and the research and development (R&D) sector. The R&D sector is where new ideas are generated and therefore goes beyond the classical model in modeling economic growth as a factor of capital (K), labor (L) and technology (A). It is worth noting that in the production of new knowledge, some levels of capital, labor, and knowledge are combined in R&D. The model assumes a generalized Cob-Douglass production function and takes the fractions of output saved and the fractions of the labor force and capital stock used in R&D as exogenous and constant.

The endogenous growth model extends the neoclassical theory by making the rate of technological progress or rate of population growth or both endogenous factors. Three different approaches had been adopted to make technological progress as an endogenous factor in determining economic growth.

First, the production function can be written as:

$$Y(it) = F(K(it), L(it), A(t)) \quad --- \qquad --- \qquad --- \quad (3.1)$$

Equation 3.1 shows that the level of output depends on the amount of capital, labor and exogenous level of technology. The subscript of technology appears in the above form because the same knowledge used in one sector can still be used in the other sector. Romer in line with the above model posits that investment is a source of technological progress. The endogenous model considers that whereas production function of a firm exhibits a constant return to scale, there occur external increasing returns to scale. These external increasing returns are due to technological improvements which result from (1) rate of investment, (2) size of capital stock, and (3) the stock of human capital.

This approach to endogenous technological change can be incorporated into the neoclassical model. Representing technological progress as a function of investment, the model can be written as:

$\lambda = a + b\left(\frac{\Delta k}{y}\right)$ – – – – – – – – – – – – (3.2)a+bΔk/y---- ----- --- (3.2)

Where a is an exogenous component of technological progress, $b\left(\frac{\Delta k}{y}\right)$ is the endogenous component, $\left(\frac{\Delta k}{y}\right)$ being the rate of investment – change in capital stock expressed as a proportion of income. Since savings is exogenous and it is equal to $b\left(\frac{\Delta k}{y}\right)$, we can write equation 3.2 as

$\lambda = a + bs$ – – – – – – – – – – – – – (3.3)a+bs ---- ------ -(3.3)

he foregoing indicates that increase in savings and a rise in investment rate will cause permanent growth rate.

The conclusion of this model is that if technological progress depends on the growth of capital, that is, investment, new investment will foster innovations and improvement in machines and tools that also creates external benefits and lead to increasing returns for the economy as a whole. Another importance of the endogenous model, investment in human capital is also assumed to be the source of technological progress.

3.2 Model Specification

Following the theoretical framework, the research therefore specify four models to capture the four objectives stated in chapter one. The models are as follows:

Model I

Following the theoretical framework designated above, this model will be used to access the impact of financial market development on economic growth of West African countries. The basic form of the model can be stated as:

$$Y_{it} = f\left(Y^{\gamma}{}_{it-1}, FD^{א}{}_{it}, PK^{\tau}{}_{it}, LB^{ב}{}_{it}, INF^{\omega}{}_{it}, TO^{\emptyset}{}_{it}\right) \quad ---(3.4)$$

Obtaining the natural log of equation 3.4 gives

$$LnY_{it} = \varphi LnY_{it-1} + אLnFD_{it} + \tau LnPK_{it} + בLnLB_{it} + \omega LnINF_{it} + \emptyset LnTO_{it} \quad --(3.5)$$

Converting equation 3.11 to econometrics form and removing the logarithm of the variables in rate yield:

$$LnRGDP_{it} = \sum_{i=0}^{n} \varphi_{ij}\, LnRGDP_{it-1} + אLnFD_{it} + \tau LnPK_{it} + בLnLB_{it} + \omega LnINF_{it} + \emptyset LnTO_{it} + \mu_t + \eta_i + \varepsilon_{it} \quad --(3.6)$$

Where:

- $lnRGDP_{it}$ is the log of real GDP. This variable serves as the dependent variable in this model and it is used to proxy economic growth of West African countries.

- $lnRGDP_{it-i}$ is the lag values of real GDP. This value is necessary to examine the impact of previous level of output on the current economic growth. The research expects positive relationship between current economic growth and the lag values of output.

- FD_{it} is the log of financial development proxy by the ratio of bank credit to the private sector to GDP (as used by other researchers like Sjöholm, (1999); Verdolini and Galeotti (2011). This variable is not logged because it is already in rate. The a priori expectation of this variable should be positive as financial market development should improve economic growth. Hence, א is expected to be positive.

- More so, $LnPK_{it}$ is the logarithm of physical capital, and it forms one of the building blocks of the new growth model. This study will use gross fixed capital formation as a proxy for capital in each country (Robert and Wadem, 2013; use the same). The coefficient of physical capital (τ) should be positively related to economic growth, as an increase in the productive capital – in line with Romer (1991) – should increase the

productivity level in the economy. Hence the coefficient of $LnPK_{it}$ i.e.τ should be positive.

- Furthermore, $LnLF_{it}$ indicate the total labour force in each selected African country. The variable is core in the model because it forms the basis of the new growth model – as labour act on other factors of production to make output possible. The relationship between the labour force and economic growth should be positive as its increase suggests an increase in human capacity that can offer themselves to productive activities. Hence, the coefficient of labour force ב should be positively related to economic growth.

- INF represent inflation rate in West African countries. Inflation rate is defined as the persistence rise in the price of goods and service. The model account to inflation because an increase in inflation will reduce the purchasing power of income and reduce aggregate demand. Reduction in aggregate demand will tend to reduce economic growth in the long-run. Hence the research expects negative relationship between inflation and economic growth.

- Lastly, TO represent trade openness. This variable is used to proxy globalization in this model. It is defined as the ratio of sum of import and export to gross domestic product. Hence, it is used to access the rate of trade in a country. An increase in TO indicates that the country's trade is more weighty and this should contribute to economic performance.

The decomposed error terms are given as μ_t, η_i andε_{it}, 'i' represent individual countries and *t* represent years in chronological order, and t>0. The error term was decomposed as $\mu_{it} + \eta_i + \varepsilon_{it}$, while ε_{it} the standard or the stochastic error term, and it varies across different countries and years, η_i is a set of the group (country)specific characteristic or effect, which then refers to each country of the model, and μ_{it} is time-specific effects.

The moment conditions are:$E[\Delta u_t FD_{it-k}] = E[\Delta u_t X_{it-k}] = 0, \forall\, k > 1$, where X are the explanatory variables.

Model II

This model will be used to capture objective two of the impact of financial development on private sector investment in West African countries. The model specification is therefore given as:

$$INV_{it} = f\left(FD^{א}_{it}, PCI^{\tau}_{it}, REX^{\gamma}_{it-1}, LF^{ב}_{it}, TO^{\emptyset}_{it} INR^{\omega}_{it,}\right) \quad ---(3.7)$$

Obtaining the natural log of equation 3.7 gives

$$LnINV_{it} = אLnFD_{it} + \tau LnPCI_{it} + \gamma LnREX_{it-1} + בLnLF_{it} + \emptyset LnTO_{it} + \omega LnINF_{it} --(3.8)$$

Converting equation 3.11 to econometrics form and removing the logarithm of the variables in rate yield:

$$LnINV_{it} = \alpha_0 + אFD_{it} + \tau PCI_{it} + בREX_{it} + \omega LF_{it} + \emptyset TO_{it} + \omega INF_{it} + \mu_t + \eta_i + \varepsilon_{it} \quad ---(3.9)$$

Where,

- $lnINV_{it}$ is the log of investment. Investment in this work is proxy by gross fixed capital formation as used by other researchers such as Ghose (2000), Garcia (2012), and Simplice and Vanessa (2015).
- FD_{it} represent financial market development – proxy by the ratio of bank credit to GDP as employed by other researchers such as Robert and Wadem, (2013). This variable will reveal the extent to which total credit generated by banks impacts on the investment of West African countries. According to Schumpeter (1911), King and Levine (1991), the impact of financial market development on investment should be positive. Hence, the coefficient ofFD_{it}, should be positive.
- PCI_{it}represent per capita income or income per head. It is GDP per population. It is often used in most studies to show income level or poverty rate. An increase in per capita income suggests improve in economic performance which should reflect on savings and investment. Hence the research expect positive relationship between PCI and INV
- REX_{it} represent real exchange rate. As it is been defined in African countries, it is domestic currency per unit of foreign currency, we expect a negative relationship between a rise in exchange rate and economic growth as a rise in exchange rate can generate capital flight – as foreign investment yield capital gain. As employed by other researchers

such as Allen, Otchere and Senbet (2011); Antonios (2013) among others, this research will also use real exchange rate in the analysis. Depreciation in exchange rate makes foreign investment more attractive. Hence, the coefficient of the exchange rate (ϑ))is expected to be negatively related to domestic investment.

- $LnLF_{it}$ indicate the total labour force in each selected African country. The relationship between the labour force and investment should be positive as its increase suggests an increase in human capacity that can offer themselves to productive activities. Hence, the coefficient of labour force should be positively related with investment.
- TO represent trade openness. This variable is used to proxy globalization in this model. It is defined above as the ratio of sum of import and export to gross domestic product. Hence, it is used to access the rate of trade in a country. An increase in TO indicates that the country's trade is more weighty and this should contribute to economic performance and investment.
- INF represent inflation rate in West African countries. Inflation rate is defined above as the persistence rise in the price of goods and service. The model account to inflation because an increase in inflation will reduce the purchasing power of income and reduce aggregate demand and investment. Hence the research expects negative relationship between inflation and investment.

The error term is decomposed as $\mu_{it} + \eta_i + \varepsilon_{it}$, while ε_{it} the standard or the stochastic error term, and it varies across different countries and years, η_i is a set of the group (country)specific characteristic or effect, which then refers to each country of the model, and μ_{it} is time-specific effects.

Model III

This model will be used to estimate the impact of globalization on financial market development in West African countries. The model specification to achieve this objective can be stated as:

$$FD_{it} = f(FDI, INTR, INF, RER, PCI, TO) \qquad ---(3.10)$$

Expressing equation 3.10 in econometrics form gives

$$LnFD_{it} = \alpha_0 + \aleph FDI_{it} + \tau INTR_{it} + \beth INF_{it} + \omega RER_{it} + \emptyset pPCI_{it} + \omega TO_{it} + \mu_t + \eta_i + \varepsilon_{it} \quad --- (3.11)$$

Where,

- $lnFD_{it}$ FD_it is the log of financial development proxy by the ratio of bank credit to the private sector and GDP (also used by De Gregorio and Guidotti (1995)).

- FDIIrepresent foreign direct investment. Foreign direct investment is the inflow of liquidity in form of medium and long term investment. The inflow of foreign direct investment should act as catalyst to the development of the financial system. Hence the research expects positive relationship between FDI and financial development.

- $INTR$TRndicates interest rate. Interest rate is the cost of borrowing or cost of capital. An increase in interest rate reduces the profitability of investment and reduces lending. Therefore, an increase in interest rate will reduce the performance of the financial system. Hence, the research expects negative relationship between INTR and financial market development.
- INF represent inflation rate. The variable still maintain its definition as given above. An increase in inflation can induce cost push inflation and reduce investment. this will reduce the performance of the financial market. Hence the research expects negative relationship between inflation and financial market development.
- REX_{it} represent real exchange rate. The research expects a positive relationship between a rise in exchange rate and financial market development as a rise in exchange rate can generate more demand for domestic currencies in trade. Hence, the coefficient of the exchange rate is expected to be positively related to financial market development.
- PCI_{it}represent per capita income or income per head. It is GDP per population. An increase in per capita income suggests improve in economic performance which should reflect on savings and demand for investment funds. Hence the research expect positive relationship between PCI and financial market development

- TO represent trade openness. This variable is used to proxy globalization in this model. It is defined above as the ratio of sum of import and export to gross domestic product. Hence, it is used to access the rate of trade in a country. An increase in TO indicates that the country's trade is more weighty and this should contribute to economic performance and investment.

The error term is decomposed as $\mu_{it} + \eta_i + \varepsilon_{it}$, while ε_{it} the standard or the stochastic error term, and it varies across different countries and years, η_i is a set of the group (country)specific characteristic or effect, which then refers to each country of the model, and μ_{it} is time-specific effects.

Model IV

To estimate the impact of financial development on per capital income of West African countries, the researcher specifies the model below:

$$PCI_{it} = f(FD, INTR, INF, RER, RGDP) \quad ---(3.12)$$

Expressing equation 3.10 in econometrics form gives

$$PCI_{it} = \alpha_0 + \aleph FD_{it} + \tau INTR_{it} + \beth INF_{it} + \omega RER_{it} + \emptyset pRGDP_{it-1} + \mu_t + \eta_i + \varepsilon_{it} \quad --(3.13)$$

Where,

- PCI_{it} is per capita income,
- FD_{it} represent financial market development – proxy by the ratio of bank credit to GDP as employed by other researchers such as Robert and Wadem, (2013). This variable will reveal the extent to which total credit generated by banks impacts on the investment of West African countries. According to Schumpeter (1911), King and Levine (1991), the impact of financial market development should be positive on growth. Hence, the

coefficient ofFD_{it}, should be positively related with per capita incomeould be positively related with per capita income

- $INTR$TRndicates interest rate. Interest rate is the cost of borrowing or cost of capital. An increase in interest rate reduces the profitability of investment and reduces lending. Reduction in lending will reduce economic growth and per capita income. Hence, the research expects negative relationship between INTR and per capita income.

- INF represent inflation rate. The variable still maintain its definition as given above. An increase in inflation can induce cost push inflation and reduce purchasing power and per capita income. Hence the research expects negative relationship between inflation and per capita income.
- REX_{it} represent real exchange rate. The research expects a positive relationship between a rise in exchange rate and per capita income as a rise in exchange rate can generate more demand for domestic goods. Hence, the coefficient of the exchange rate is expected to be positively related to financial market development.

- $RGDP_{it-1}$ is lag value of real GDP. The research aimed to examine the impact of previous level of income on the current level of per capita income. The research expects a positive relationship between per capita income and lag value of real GDP.

The error term is decomposed as $\mu_{it} + \eta_i + \varepsilon_{it}$, while ε_{it} the standard or the stochastic error term, and it varies across different countries and years, η_i is a set of the group (country)specific characteristic or effect, which then refers to each country of the model, and $\mu_{it}$is time-specific effects. It is also worth emphasizing that the error terms are assumed to be serially non-correlated, especially the second order correlation.

3.3 Justification of the Model

Financial variables are subject to high cyclical variations – random walk phenomenon, and it is difficult to control for secular trends in those variables – especially the financial data with annual frequency, combined with other stochastic variables (Chinn and Ito; 2002, 2006). To this effect, García (2011) posit that to avoid the problem of endogeneity associated with the short-run cyclical effect, it is important to employ an average annual growth rate of the variables over five

years period. This is also employed in this study to avoid the problem of endogeneity, bearing in mind that the degree of freedom in this analysis will be small

In this study, annual time series of financial development and economic growth will be used – as used by some authors (Baltagi et al., 2009; Calderon and Kubota, 2009; W. Huang, 2006; Naceur et al., 2008). Fama (1965, 1991) also notes that it is ideal to think that the cyclical variation inherent in random walk model of the financial variables if they fluctuate within a range, they are rational and some consequences of the normal cycle of business.

3.4 Pre-Estimation Tests

3.4.1 Descriptive Statistics

In every empirical research, the first step that we should take into consideration is the description of basic variables used in each analysis in order to give an overall view of every researcher for the variables used. The descriptive statistics would be used to understand the nature of each data used in the model. The descriptive statistic also helps us to know the distributive nature of these data over time, which can be obtained through their averages (Gujarati, 2010)

3.4.2 Panel Unit Root Test

For the country-specific analysis, unit root would be conducted on the series. The essence of this is to verify if the variables could be trusted for the purpose of forecasting. The Augmented Dicky-Fuller (ADF) through the Levine-Lin-Chu test would be used in this section to verify the existence or not of a unit root in the individual series. With ADF being a unit root with null specified as unit root, its result would be confirmed by the LLC whose null states stationary. Thus, the model is treated as a time series. Given the various conditions that characterize the various panel unit root tests, under the general assumption of cross-sectional independence as applicable to first generation panels, the Im-Persiaran-Shin (IPS) test would be used in verifying the presence of unit root in the panel series. This test abhors the assumption of Levin-Lin-Chu test, thatρ_i must be the same for all series under the alternative hypothesis. The hypotheses to be tested are:

H_0: The panel data has a unit root

H_1: The panel data series has no unit root

The test statistics are given below as

$$T = \frac{1}{N}\sum_{i=1}^{N} tp_i - - \qquad - - - (3.8)$$

If p<1, then the variable is time-invariant and if $p = 11$ there is a unit root problem in the model

3.4.3 Panel Cointegration Test

If discovered that stationarity is achieved not only in levels, there would need to conduct a cointegration test, this is done in other to ascertain if there exists a long-run cointegrating relationship among the panel variables. The cointegration tests developed by Westerlund (2007) will be employed. This test for the absence of cointegration by determining whether there exist error correction for individual panel members or for the panel as a whole. The tests are general enough to allow for a large degree of heterogeneity, both in the long-run cointegrating relationship and in the short-run dynamics, and dependence within as well as across the cross-sectional units.

$H_0: \sigma_{ij} = 0\ (ij)$. This means that there is no contemporaneous correlation between the errors; hence SUR estimation technique is not appropriate.

$H_1: \sigma_{ij} \neq 0\ (ij)$. This means there exist a contemporaneous correlation, hence, SUR estimation technique is appropriate.

3.4.4 The Hausman Test

According to Dimitrious and Stephen (2007), the Hausman test was formulated in assisting choice making between the fixed effect estimator and the random effect estimator. Hausman (1978) adopt a simple test based on the notion or idea that under the assumption of no correlation, both OLS and GLS are consistent, but is inefficient, while under the alternative hypothesis, OLS is consistency, but GLS is not. More specifically, Hausman assumed that there are two estimators $\hat{\beta}_0$and$\hat{\beta}_1$of the parameters of$\beta$and he added two hypothesis testing procedures.

Under the null hypothesis (H_0), both estimators are consistent but $\hat{\beta}_0$is inefficient, and under the alternative hypothesis, (H_1), $\hat{\beta}_0$is inefficient, but $\hat{\beta}_1$ is consistent.

3.5 Estimation Procedure

This study will employ the generalized method of moments (GMM) estimation technique, as the model tends to yield efficient result in panel data analysis especially when the number of observations and years are large. If the assumption of no serial autocorrelation holds, the first difference transformation may consistently estimate equation by equation through instrumental lagged differences with differences and levels of Yit from earlier periods as proposed by Anderson and Hsiao (1982).

3.6 Diagnostics Tests

This section of the methodology outlines the various test to be conducted in order to ascertain the reliability of results obtained from the estimations.

3.6.1 Testing for time-fixed Effects

This test will be carried out to see if time fixed effect is needed in estimating the fixed effect models. It is a joint test to see if the dummies for all the years are jointly equal to zero. If this assumption holds, then it means that there is no time effect in the model. The decision rule here is that we reject the null hypothesis if the probability value estimated is less than 5 percent.

3.6.2 Test for Serial Correlation

Serial correlation tests apply to macro panels with long time series mostly over 20 years. This is not a problem in micro data with few numbers of years. Serial correlation causes the standard errors of the coefficient to be smaller than their actual values, and also over-estimates the R-squared. The null hypothesis here states that there is no serial correlation. We reject this hypothesis if the probability value estimated is less than 5 percent.

3.6.3 Heteroscedasticity Test

A test for heteroscedasticity is available for fixed effect model. The null hypothesis here is that the model is homoscedastic. We reject this hypothesis if the probability value estimate is less than 5 percent

3.6.4 Testing for Cross-Sectional Dependence – The Breush-Pagan LM test for Independence and Pasaran Cross-Sectional Dependence (CD) Test

According to Baltagi (2008), cross-sectional dependence is a problem in macro panels with long time series (over 20-30 years). Pasaran CD test is used to test whether the residuals are correlated across entities. Cross-sectional dependence can lead to bias in tests results (also called contemporaneous correlation). The null hypothesis is that residuals are not correlated. The test is applicable only to the fixed effect model alone. The result is presented in the table below.

3.7 Source of Data And Statistical Package

Panel data from 1975 to 2016 would be employed for this empirical work. The data would be gotten from World Bank (2017). In this study, the researcher will employ software packages such as Microsoft Excel and Stata 13.

CHAPTER FOUR

PRESENTATION AND INTERPRETATION OF RESULTS

4.1 Introduction

This chapter focused on the presentation of the research findings. It shows the summary values of the regression analysis on which the objectives and hypothesis stated in chapter one are evaluated. This chapter also validates the theory/hypothesis based on the West African case, and to examine its applicability. The regression results are also subjected to economic, statistical and econometric tests as stated in chapter three.

4.2 Descriptive Statistics

This section examines the nature of the variables used in the work. The basic descriptive statistics of mean and the standard deviation of the variables are presented in the table below.

Table 4.2: Descriptive statistics table of the variables used in the model

Table 4.1: Descriptive statistics table of the variables used in the model

VARIABLE		MEAN	STD. DEV.	MAX.	MIN.
RGDP	overall	53.0	1020	6980.0	6.25
	between		914.0	3.140.0	14.0
	within		536.0	4.36e+13	1090.0
FD	overall	22.67898	13.55856	90.04463	0.0019099
	between		7.36816	31.49084	12.88152
	within		11.59172	3.409997	85.73618

FDI	overall	0.370	1.12	8.84	0.074
	between		0.719	2.44	6581274
	within		8.82	6.77	-2.81
PCI	overall	314313.5	313156.8	1509192	525.4869
	between		316900.2	1085540	775.1984
	within		81013.13	739607.9	43153.95
PC	overall	7730.0	1550.0	11200.0	102.0
	between		1220.0	4330.0	2.13
	within		1.02	7.68	2.39
LF	overall	3192405	0.0107	574	1.047043
	between		0.0105	349	15.9349
	within		3701439	2.57	1.75
TO	overall	2930584	2686046	21.12435	1.33
	between		2348696	7539567	50.61606
	within		1479371	8664047	2481516
INF	overall	13.75736	22.52373	165.6766	7.594284
	between		11.65364	32.5734	4.051029
	within		19.5851	148.2498	-23.43554
INT	overall	11.98979	8.665819	62.83333	4.736667

	between		7.393358	24.91098	5.895023
	within		5.028989	49.91214	4.530441
REXR	overall	59.15142	28.33704	253.4922	0.5467809
	between		12.13524	79.61875	40.69926
	within		25.86129	243.7629	-9.182572

Source: Authors computation from the result obtained in the appendix

In analyzing the various components of the table above, it is observed that the mean value of real GDP (RGDP) of these countries is 53 billion, while the overall standard deviation is given as 102 billion. This shows that the variable drift far from its mean value as the between and within standard deviations are 914 billion and 526 billion respectively. The result also revealed that some countries have high RGDP as the maximum value 6.98 trillion while some countries have a low RGDP value as the result shows a minimum value of 6.25 billion.

Financial market development on the other hands also shows an average value of 22.67 percent which means that on the average, the total credit available to the private sector is approximately 23 percent of the GDP. This value is high, which means that if that financial market impart is high in the region. The value of the overall standard deviation is 13.6, which shows that FD did not drift far from its mean value overtime. It is also worth noting that some country have a high percentage of credit creation as the maximum value is 90 percent, while some country have a low percentage of 0.002 percent.

Furthermore, foreign direct investment shows an average of 370 million over the study years. The overall standard deviation is 1.2 billion while between and within standard deviations are 719 million and 8.8 billion respectively. The within standard deviation suggest that this variable drift far from its mean value across sample. The maximum value of this data is 8.4 billion while the minimum value is 74 million. This suggests that some countries have high direst investment than others.

The average value of per capita income in this region is given as 314 thousand, which shows that this region is actually living in relative poverty. The standard deviation is 313 thousand which further shows that some countries relatively have low per capita income in the region.

The mean value of gross fixed capita – proxy for investment – is 773 billion, which shows that capital formation is high in the region. The standard deviation of PC is 1.5 trillion. This shows that there is high disparity in capital formation in the region. Trade openness on the average is 3 million. It shows that West African trade is highly liberalized. The standard deviation for this variable is also approximately 3 million. This therefore posits that there is much discrepancies in the degree of trade openness in this region.

Average real exchange rate in the region is approximately 59/$ and the standard deviation is 28. There is no much discrepancy in real exchange rate within the region. Furthermore, average labour force in the region is 3 million. This shows a high active population in this region. The standard deviation is 11 million, which shows a high rate of discrepancy in labour force participation rate across this region.

4.3 Panel Unit Root Result

The order to ascertain the order of integration of the variables of interest, the research examines the unit root test using Levin-Lin-Chu test. The estimation used the Levin-Lin-Chu test which assumes a common autoregressive parameter for all panels. The Levin–Lin–Chu test with panel-specific means but no time trend requires that the number of time periods grow more quickly than the number of panels, so the ratio of panels to time periods tends to zero. The test involves fitting an augmented Dickey–Fuller regression for each panel; and it required that the number of lags to include be selected based on the AIC with at most 10 lags.

Table 4.3: Unit root test of the Variables

Variables	**ADF Statistic at Level**	**Prob. Value**	**ADF Statistic at First Difference**	**Prob. Value**	**Order of integration**
RGDP	14.7290	1.0000	-3.2674	0.0005	I (1)
FD	0.5930	0.7234	-6.9999	0.0000	I (1)

PCI	0.0834	0.5332	-7.3197	0.0000	I (1)
GFCF	0.5679	0.7149	-5.2065	0.0000	I (1)
TO	-0.5274	0.2990	-11.9414	0.0000	I (1)
RER	-1.2500	0.1057	-8.0483	0.0000	I (1)
LF	-0.2890	0.3863	-9.5929	0.0000	I (1)
INF	0.4919	0.6886	-15.2024	0.0000	I (1)
INTR	-1.0346	0.1504	-8.4498	0.0000	I (1)
FDI	1.4627	0.9282	-8.0014	0.0000	I (1)

Source: Authors computation from the result obtained in the appendix

Hypothesis Testing

H_0: $\delta = 0$ (the variables are non-stationary)

Decision Rule: reject H0 if the absolute value of $ADF_{cal} > ADF_{tab}$ or $Pr < 0.05$.

The result Levin–Lin–Chu test in the table above shows that none of the variables was significant at the level form, but were all stationary at their first difference. Hence, all the variables used in the model are integrated of order one i.e I (1) process.

4.4 Cointegration Result

Since all the variables of interest are not stationary at order zero, there is need to conduct the co-integration test to ascertain their long-run relationship. The Westerlund technique developed in 2007 will be employed. The focus of this test is to examine the absence of cointegration by determining whether there exists error correction for the panel as a whole or for individual panel members. The test encompasses large degree of heterogeneity both in the short-run dynamics and the long-run cointegrating relationship, as well as dependence on within and across the cross-sectional unit (Persyn, 2010).

The Gt and Ga statistics test for the presence of short-run relationship or long-run cointegrating for at least one individual country. The statistics are computed using the weighted average of the individually estimated t-ratio's in the model. One the other hand, the Pt and Pa test statistics

examine the pool information across the sectional unit. The rejection of H0 suggests the rejection of the presence of cointegration for the model.

Table 4.4: Cointegration Test

MODELS	Statistic	Stat. Value	Z – Value	Prob. Value
Model 1	Gt	-0.772	4.651	1.000
	Ga	-1.069	4.602	1.000
	Pt	1.244	6.124	1.000
	Pa	0.522	3.568	1.000
Model 2	Gt	-0.659	5.743	1.000
	Ga	-0.357	5.368	1.000
	Pt	-4.587	2.064	0.981
	Pa	-0.868	3.462	1.000
Model 3	Gt	-1.568	2.791	0.997
	Ga	-0.324	5.380	1.000
	Pt	-2.507	3.807	1.000
	Pa	-0.428	3.628	1.000
Model 4	Gt	0.595	9.106	1.000
	Ga	-0.086	5.027	1.000
	Pt	6.031	10.042	1.000
	Pa	0.951	3.746	1.000

Source: Authors computation from the result obtained in the appendix

Hypothesis Testing

H_0: δ=0 (No cointegration)

Decision rule: reject H0 if Pr> 0.5

The co-integration result in presented in table 4.4 above shows that the probability value for Gt, Ga, Pt and Pa are all greater than 0.05 for model all the model. This therefore shows that there is long-run relationship in the models both for individual country and in the panel as a whole. The confirmation of long-run co-integrating equation therefore will necessitate the estimation of Hausman test to ascertain the type of model to be used.

4.5 The Hausman Result

In order to decide whether to employ fixed effect or random effect, the research adopt the Hausman test. It basically tests whether the unique errors (*ui*) are correlated with the regressors, the null hypothesis is they are not. The null hypothesis of this model is the preference of random effect to fixed effect against the alternative hypothesis of fixed effect (Greene, 2008).

Table 4.5: The Hausman Result

MODELS	CHI-SQUARE	PROBABILITY	DECISION
1	11.76	0.0192	FE
2	0.56	0.9061	RE
3	88.33	0.0000	FE
4	4.08	0.5378	RE

Source: Authors computation from the result obtained in the appendix

Hypothesis Testing

H0: = β0 are consistence but not efficient, hence employ the fixed effect.

Decision rule: Accept H0 of fixed effect if Pr < 0.5.

From the result of Hausman test above, the best model to be employed for model 1 and 3 is the fixed effect, since their probability level is less than 5%, we conclude that to obtain a consistence

estimates, fixed effect should be employed. Also, since the Pr value of model 2 and 4 are greater than 5%, we conclude that these models will necessitate the use of random effect.

4.6 Presentation and Interpretation of Regression Results

4.6.1 Model 1: Impact of Financial Market Development on Economic Growth of West African Countries

The result presented in the table below shows the impact of financial market development on economic growth of West African countries.

Table 4.6.1: Impact of financial market development on economic growth of West African countries

Variables	Coefficient	Z – Value	Probability
C	0.1455575	3.96	0.000
LLRGDP	0.9922015	395.71	0.000
FD	-0.000519	-2.88	0.004
LPC	0.0043	2.48	0.013
LF	7.47e-10	2.83	0.005
INF	-0.000244	-2.08	0.037
TO	2.50e-09	2.54	0.011

Source: Author's computation with result in Appendix E1.

In sum,

$$LRGDP_t = 0.15 + 0.992LRGDP_{t-1} - 0.001FD_t + 0.04LPC_t + 0.000LF_t - 0.0002INF_t + 0.000TO_t$$

The result presented above shows that holding other influence that influences economic growth constant, one period lag-value of real GDP have a positive impact on current level of economic growth in West African countries. The result revealed that a one percent increase in lag-value of economic growth will also increase current economic growth by approximately one percent. This value is statistically significant and conformed to its theoretical expectation and the empirical work Maduka, Madichie and Eze (2017).

Further, financial market development shows a significant negative relationship with economic growth. This result negates it a priori theoretical expectation as financial market development should generate a positive impact on economic growth. One of the reasons why this occurs could be administrative bottleneck and the difficulties in credit accessibility by the private sector. Other reason could be as a result of low profitable ventures in the region that enhances the growth of credit creation by the financial system. This result conformed to the empirical results ofCollier and Dollar (2002) and Maduka, Madichie and Eze (2017)

Moreover, physical capital – which represents investment – shows a positive relationship with economic growth of West countries. The result shows that a one percent increases in stock of physical capital will leads to four percent increase in economic growth in the long-run. The result conformed to its theoretical expectation of Solow–Swan (1956) and the empirical model of Batuo and Asongu (2015). Hence, the research concludes that physical capital has positive relationship with economic growth in West African countries.

Labour force though has a positive significant impact on economic growth; the magnitude of its impact is close to zero in the long-run. The result shows that labour force has the potential to positively impact economic growth, which conformed to the theoretical expectations of Solow – Swan (1956). The result also affirmed the empirical model of Batuo and Asongu (2015).

Inflation rate shows a negative relationship with economic growth. The result posed that a one percent increase in inflation will reduce economic growth by two percent in the long-run. This is so because inflation reduces the purchasing power of money, and when it has fully being accounted for, has the potential of reducing the real value of GDP. This same result was obtained by other researchers such as Omojolaibi, Mesagan and Stanley (2016); Maduka, Madichie and Eze (2017).

Lastly, trade openness shows a positive impact on economic growth. This means that globalization have a positive impact on economic growth of West African countries, though the magnitude of this variable is close to zero. This result conformed to the empirical findings of Batuo and Asongu (2015); Omojolaibi, Mesagan and Stanley (2016) and Maduka, Madichie and Eze (2017).

4.6.2: Impact of Financial Market Development on Investment of West African Countries

The result presented in this section focus on the impact of financial market development on economic growth of West African countries. The table below gives the summary statistics of the result.

Table 4.6.2: Impact of financial market development on investment in West African countries

Variables	Coefficient	Z – Value	Probability
C	23.00176	57.40	0.000
FD	-0.008809	-0.97	0.333
PCI	5.02e-06	12.13	0.000
REXR	-.0150021	-3.32	0.001
LF	1.77e-07	14.06	0.000
INF	-.0610746	-11.65	0.000
TO	3.04e-07	6.51	0.000
INTR	.0862103	5.81	0.000

Source: Author's computation using result in Appendix E2

In sum,

$$LINV_t = 23 - 0.01FD_t + 0.00PCI_t - 0.02REXR_t + 0.00LF_t - 0.06INF_t + 0.00TO_t + 0.09INTR_t$$

The result presented above shows that financial market development has no significant relationship with investment in West African countries within the study years.

Per capita income (PCI) shows a positive relationship with investment in West African countries within the study years. The magnitude of this impact is however close to zero. This result is in line with Maduka et al., (2017) who posited that increase in per capita income leads to an increase in investment.

More so, real exchange rate shows a negative relationship with investment in the region. A unit increase in real exchange rate reduces investment by two percent. This is so because depreciation of exchange rate could lead to capital flight as foreign investment tends to yield capital gain in relative to domestic investment.

Furthermore, labour force has a positive relationship with investment in the region. The magnitude of this variable is close to zero in the long-run. Hence, an increase in labour force has the potential of increasing investment in West African Countries. Some of the reasons while the magnitude of this variable is close to zero as suggested by Feridun et al., 2006) include high rate of unemployment, low level of skills and low productivity.

Inflation rate has a negative relationship with investment in West African countries. The result shows that a one percent increases in inflation rate will leads to six percent decrease in domestic investment of this region in the long-run. This is because an increase in inflation rate increases the prices of goods which could generate high profit and motivate more investment. Some researchers also obtained similar result as can be found in the works of Mobolaji and Ndako (2008); Maduka et al., (2017).

Moreover, trade openness has a positive and significant relationship with investment of this region. The magnitude impact of this variable is close to zero probably because these countries export more of primary product. This result supports the empirical works of Sylla and Rousseau (2003), Micheal and Christopher, (2015).

Lastly, interest rate of lending rate shows a positive relationship with investment. This result negates the theoretical model of Keynes (1936) as he predicted negative relationship between interest rate and economic growth. The result shows that a one percent increases in interest rate will lead to nine percent increase in investment in the long-run.

4.6.3: Impact of Globalization on Financial Market Development in West African Countries

The result presented in this section examines the impact of globalization on financial market development of West African countries. The result is summarized in the table below

Table 4.6.3: Impact of Globalization on Financial Market Development in West African Countries

Variable	Coefficient	Z – Value	Probability
C	18.35174	9.25	0.000

FDI	-7.87e-10	-1.20	0.229
INTR	-.3327405	-4.37	0.000
INF	.0727395	2.65	0.008
REXR	.0584303	2.25	0.025
PCI	.0000134	6.39	0.000
TO	-1.73e-08	-0.08	0.939

Source: Researcher's computation using result in Appendix E3

In sum,

$$FD_t = 18.3 - 0.000FDI_t - 0.33INTR_t + 0.073INF_t + 0.058REXR_t + 0.000PCI_t - 0.00TO_t$$

The result above shows that holding other variables constant, average credit creation – proxy for financial market development – is 18 percent of the GDP. This value is very low as Egypt, Morocco and South Africa in other region has their percentage as high as 60 percent (WDI, 2017).

Furthermore, the two indicators for globalization – foreign direct investment (FDI) and trade openness (TO) – show a negative relationship with financial market development of this region. This does not conformed to its a priori theoretical expectation as foreign direct investment and trade openness should boost financial market development. Hence, we conclude that globalization has a negative relationship with financial market development in West African countries.

More so, interest rate has negative relationship with financial market development in West African countries. The result shows that a one percent increase in interest rate will leads to 0.3 percent decrease in financial market development. This result conformed to its a priori expectation as increase in interest rate reduces the profitability of investment and reduces borrowing (Sylla and Rousseau 2003; Micheal and Christopher, 2015). Hence the research concludes inflation has a negative impact on financial market development.

Moreover, inflation rate has a positive relationship with financial market development. The result shows that a one percent increases in inflation will increase financial market development by

0.07. This result conformed to its a priori expectation as increase in inflation rate can create profit incentives which will motivate investors to borrow (Mishkin, 2009).

Per capita income shows a positive impact on financial market development in the region. The magnitude of this impact is however close to zero. The research however concludes that increase in per capita income has the potential of increasing financial market development. This was also supported by the empirical works of Onwuka and Eguavoen (2007), and Omojolaibi, Mesagan and Stanley (2016).

4.6.4 Impact of Financial Market Development on Per Capita Income of West African Countries

The result presented above shows the impact of financial market development of per capita income of West African countries. The result is summarised in the table below

Table 4.6.4: Impact of financial market development on per capita income of West African countries

Variable	Coefficient	Z – Value	Probability
C	-1858386	-13.79	0.000
FD	5540.073	6.67	0.000
INTR	9203.286	6.86	0.000
INF	2001.863	3.94	0.000
REXR	553.5521	1.40	0.163
LRGDP	67764.98	13.94	0.000

Source: Researchers compilation using data in Appendix E4

Hence,

$$PCI_t = -1858 + 5540FD_t + 9203INTR_t + 2002INF_t + 554REXR_t + 67745LRGDP_t$$

Financial market development shows a positive impact on income per head in West African countries. The findings shows that a one percent increases in the level of credit accessibility to the private sector in the long-run will leads to 5540 increase in economic growth. A similar result was obtained by Micheal and Christopher, 2015.

Interest rate also shows a positive relationship with per capita income of the region. The result shows that a one percent increase in interest rate will leads to 9203 increase in per capita income. This result does not conformed to it a priori theoretical expectations as increase in lending rate should pose a negative effect on per capita income since domestic investment tends to be affected with increase in lending rate. It also conformed to the empirical findings of Onwuka and Eguavoen (2007).

Inflation rate also shows positive relationship with per capita income. A one percent increase in inflation rate increases per capita income by 2002 in the long run. This means that increase in inflation can increase the nominal value of per capital income (Mishkin, 2009).

The real exchange rate in the region further shows a positive relationship within the region. A unit increase in real exchange rate increase per capita income by 554 in the long run. This result conformed to its a priori expectation as depreciation in exchange rate improves net export Sylla and Rousseau (2003), Micheal and Christopher, (2015).

Finally, real GDP shows a positive relationship with economic growth of the region. The result shows that a one percent increased in real GDP increase per capita income by 67745 in the long-run. This result conformed to it a priori expectation. Hence, the research concludes that increase in real GDP increases per capita income in West African countries. Other researchers such as Omojolaibi, Mesagan and Stanley (2016); Maduka, Madichie and Eze (2017) also obtained similar result.

4.7 Diagnostics Test

4.7.1 Test for Time Fixed Effect

This test was carried out to know whether time effects are needed in the estimated model. It only applied to the fixed effect model alone. The test examines whether the dummy variables predicted by random effect and apportioned to each year are jointly equal to zero. If they are, then there is no time effect in the model. This result is applicable to model 2 and 4 respectively as determined by the Hausman test – see the Hausman test in section 4.3 above.

Table 4.7.1: Test for time effect

Model	Fcal.	Prob.
Model 1	1.22	0.1746
Model 3	0.92	0.6193

Source: Authors computation from the result obtained in Appendix F.

Hypothesis Testing

H0: $\theta_{1t} = \theta_{2t} = \theta_{nt} = 0\alpha$

Decision Rule: Reject H0 is prob. < 0.05

The result above, the probability level for the time effect test is greater than 5 percent in model 2 and 4. Hence, we conclude that there is no time effect for these models. Hence the models are estimated without time dummies. We accept the null hypothesis of no time effect. Hence the model was estimated without time effect (see Appendix F).

4.7.2 Testing For Random Effects: Breusch-Pagan Lagrange Multiplier (LM)

The LM test helps you decide between a random effects regression and a simple OLS regression. The null hypothesis in the LM test is that variances across entities are zero. That is, there no significant difference across units (i.e. no panel effect). If the variances are jointly equal to zero, then it means that OLS regression is more appropriate in the analysis. The result is presented in table 4.7.2 below

Table 4.7.2: Breusch-Pagan Lagrange multiplier (LM) test

Models	Chi-Square	Prob.
Model 1	462.570	0.0000
Model 3	618.199	0.0000

Source: Authors computation from the result obtained in the appendix

Hypothesis Testing

H0: $\delta_{1t} = \delta_{2t} = \delta_{nt} = 0$

Decision rule: Reject H0 if Prob. < 0.05, otherwise do not reject.

From the result presented above, we reject the H0 of zero variances across West African countries. Therefore, we conclude that random effect is more appropriate in estimating this model.

4.7.3 Testing For Cross-Sectional Dependence/Contemporaneous Correlation: Using Pasaran Cross-Sectional Dependence (CD) Test

According to Baltagi (2008), cross-sectional dependence is a problem in macro panels with long time series (over 20-30 years). Pasaran CD test is used to test whether the residuals are correlated across entities. Cross-sectional dependence can lead to bias in tests results (also called contemporaneous correlation). The null hypothesis is that residuals are not correlated. The test is applicable only to the fixed effect model alone. The result is presented in the table below.

Table 4.7.3: Pasaran Cross-Sectional Dependence (CD) test

Model	**Pasaran Stat.**	**Prob.**
Model 1	2.298	0.0215
Model 3	1.870	0.0614

Source: Authors computation from the result obtained in the Appendix H

Hypothesis Testing

H0: $\mu_{i1t} = \mu_{i2t} = \mu_{int} = 0$ (No serial correlation)

Decision rule: Reject H0 if prob. < 0.05. Otherwise, do not reject.

From the result presented in table 4.7.3 above, we conclude that model one did not contain serial correlation. This is shown by the probability level of 0.02. On the other hand, model three shows the presence of serial correlation. This is shown by the probability level of 0.06 as shown in the table above.

To correct for the problem of serial correlation (cross-sectional dependence) in the model, the Driscoll and Kraay standard errors estimation was used in the estimation of the result presented in section 4.4 above (see Appendix D).

4.7.4 Testing for Heteroscedasticity

Modified Wald test for group wise heteroscedasticity in fixed effect regression model are invoked to examine whether the variances are constant overtime. The null hypothesis here is that the variances are constant overtime. The results are presented in the table below.

Table 4.7.4: Wald test for group wise heteroscedasticity

Model	**Chi-Square**	**Prob.**
Model 2	1.7e+05	0.0000
Model 4	252.64	0.0000

Source: Authors computation from the result obtained in the appendix

Hypothesis Testing

H0: $\delta^2{}_{1it} = \delta^2{}_{2it} = \delta^2{}_{nit} = \delta^2$ (Model is homoscedastic)

Decision Rule: Reject H0 is Prob. < 0.05, otherwise, do not reject.

From the result presented above, all the probabilities are less than 5 percent. Hence, we reject the H0 of homoscedastic, and we conclude that the models contain heteroscedasticity. To correct for this problem, the Huber/White or sandwich estimators were used to obtain the heteroscedasticity-robust standard errors (see Appendix I).

4.7.5 Testing for Serial Correlation

Serial correlation tests apply to macro panels with long time series (over 20-30 years). Not a problem in micro panels (with very few years). Serial correlation causes the standard errors of the coefficients to be smaller than they actually are and higher R-squared. The null is no serial correlation. The result is presented in the table below.

Table 4.7.5 Serial correlation test

Model	Fcal.	Prob.
Model 2	23.174	0.0007
Model 4	344.821	0.0000

Source: Authors computation from the result obtained in the appendix

HYPOTHESIS TESTING

H0: $\varepsilon_{1it} = \varepsilon_{2it} = \varepsilon_{nit} = 0$ (No serial correlation)

Decision rule: Reject H0 if Prob. < 0.05 percent. Otherwise, do not reject

Conclusion: Since the probability values estimated in the above table are all less than 0.05, we reject H0 of no serial correlation, and we conclude that the model contains first order serial correlation. This is due to the fact that these countries are connected through different international co-operations such as ECOWAS. The Huber/White or sandwich estimator was used to correct this problem (see Appendix D).

4.8 Evaluations of Research Hypotheses and Policy Implications of the Findings

This research examined the impact of globalization and financial market development on output sustainability of West African countries. The hypotheses guiding this work were four and different analyses had been carried out to ascertain the validity of those hypothesis. Hence, the hypotheses are evaluated as follows:

The first hypothesis posed in this research is that financial market development has no significant impact on economic growth of West African countries. This hypothesis is rejected following the result presented in table 4.6.1 where financial market development was found to have a significant relationship with economic growth of West African countries. The result though significant, it shows that financial market development has a negative relationship with economic growth of the region. This negates its' a priori expectation meaning that financial market has not been fully liberalized to generate desire result. This indicate that adequate measures must be taken if the region will fully benefit from financial market development by make credit more accessible to the private sector.

More so, the second hypothesis states that financial market development has no significant impact on private sector investment in West African countries. The research do not reject this hypothesis following the result obtained in table 4.6.2 where it was shown that financial market development has no significant relationship with investment in West African countries within the study years. This result does not conformed to its' a priori expectation as financial market development should generate more investment. This has a great implication on the West African region considering the deteriorating state of investment. This means that adequate measures still need to be implemented in the financial market to boost the sector as the sector has not contributed meaningfully to economic growth and investment in the region

The third hypothesis guiding this study is that globalization has no significant impact on financial market development in West African countries. We can safely reject this hypothesis in line with the result presented in table 4.6.3 where it was shown that globalization has a significant relationship with financial market development. However, the sign of globalization shows a negative relationship with financial market development which means that trade liberalization has not improve West African financial system. This could be as a result of the monoculture nature of this region and overreliance on export of raw material.

Finally, the fourth hypothesis states that globalization has no significant impact on per capita income in West African countries. The research reject this hypothesis based on the result presented in table 4.6.4 where it was shown that financial market development shows a positive impact on income per head in West African countries. This shows that this region benefited more from globalization as it is more potent to boost income per head.

CHAPTER FIVE

SUMMARY OF FINDINGS, POLICY RECOMMENDATIONS AND CONCLUSION

5.1 Summary of Findings

This research work focused on globalization, financial market development and output sustainability of West African countries. In other to achieve the above target, the study set up four objectives and research hypotheses which served as a guide in the empirical analyses. The objectives are to examine the impact of financial market development on economic growth of West African countries; ascertaining the impact of financial market development on private sector investment in West African Countries; to examine the impact of globalization on financial market development in West African countries as well as to examine the impact of globalization on per capita income in West African countries. The study employs panel analysis of 11 countries in the region which include Nigeria, Ghana, Senegal, Mali, Benin, Niger, Cote devoir, Gambia, Guinea Bissau, Burkina Faso and Sierra Leone. The data also spanned from 1978 to 2017 (40 years).

Theoretical and empirical literature were in line with the study were also reviewed. Globalization theories reviewed include absolute cost advantage by Adam Smith; comparative cost advantage theory by David Ricardo; opportunity cost theory by Haberler, and factor proportion theory by Hecksher – Ohlin among others. Economic growth theories reviewed include Classical theory of economic growth, the Marxian theory of growth, Keynesian growth theory etc. The Empirical literature was summarized into foreign and domestic literature. The classical growth theory serves as the methodological framework in this study and four models were developed in line with the stipulated objectives.

The results obtained shows that the lag value of real GDP, stock of physical capital, labour force and globalization (trade openness) has a positive and significant relationship with economic growth while financial market development and inflation shows negative relationship with economic growth of the region. In considering the impact of financial market development on investment, the variable shows a negative and insignificant relationship with investment. Per

capital income, labour force and globalization have a positive relationship with investment while real exchange rate and inflation shows a negative relationship with investment.

In accessing the impact of globalization on financial market development, the result shows that globalization have insignificant relationship with financial market development. Moreover, inflation, real exchange rate and per capita income show a positive relationship with financial market development.

Lastly, financial market development, interest rate, inflation rate, real exchange rate and real GDP shows a positive and significant relationship with per capita income of the region.

5.2 Policy Recommendation

Having observed the relationship that exists between globalization, financial market development and economic growth of West African countries, the research recommends the following policies to promote sustainable growth of this region.

First, since it was observed that globalization, stock of physical capital and labour force have positive relationship with economic growth; the government should enhance credit creation and promote low interest rate which will encourage investment. There should be promotion of free education and increase in training for the labour force to increase their productivity. The study also recommends solid infrastructural development and good workable conditions in tertiary institutions. This will enhance quality workforce that can promote economic growth. Also, there should be access to better technology – through technological transfer –, rehabilitation of the class rooms to create good working conditions, pipe bone water; electricity; access road etc. Also, in the medical sector, there should be an improvement in the access to better technology given the current deterioration state of health care services in the region. All these can be achieved if the ratio of capital expenditure improves in the budget.

More so, since it was found that financial market development had insignificant impact on economic growth, the research recommends that the financial market should be more liberalized to create more credit accessibilities and channel funds to strategic productive sectors in the economy. This will go a long way to improve the impact of the sector.

Furthermore, since the research found that globalization promotes both investment and economic growth, it will be recommend that adequate measures be taken to boost the export led and import substitution industries. This can be done by granting subsidies to them, reducing tariffs and stabilize the exchange rate to guarantee confidence in investors. This will go a long way to promote trade within the region.

Moreover, to cub another problem of low price on goods (depreciation of exchange rate), the study recommends that policies that encourages production be made to take the advantage of the current deteriorating state of exchange rate – as depreciation of exchange rate increase the demand to the domestic goods as experienced in China. This could be done through technological transfer, granting of loans – small, medium and long-term loan- to the manufacturing sector. This on its own will improve the income of the region and internally correct for exchange rate depreciation.

Finally, the study recommends that some international bodies formed by these countries employ exchange rate targeting just as the one being practiced in the European countries. This can be achieved through the introduction of common currency, and fixing the exchange rate to this currency. This, if achieved, will help in the will strengthens the region as a whole against external shocks.

5.3 Conclusion

This study examines globalization, financial market development and output sustainability of West African countries, with data from 11 countries in the region. The countries used in the study include Nigeria, Ghana, Senegal, Mali, Benin, Niger, Cote devoir, Gambia, Guinea Bissau, Burkina Faso and Sierra Leone. The data also spanned from 1978 to 2017 (40 years). Panel regression techniques through the fixed and random effects estimation technique was applied in the data analysis. Pre-estimation and post estimation test were also carried out to ascertain the nature of the data and to examine the robustness of the regression result. The result shows results that the lag value of real GDP, stock of physical capital, labour force and globalization (trade openness) has a positive and significant relationship with economic growth while financial market development and inflation shows negative relationship with economic growth of the region. Also in considering the impact of financial market development on investment, the

variable shows a negative and insignificant relationship with investment. Per capital income, labour force and globalization have a positive relationship with investment while real exchange rate and inflation shows a negative relationship with investment. In accessing the impact of globalization on financial market development, the result shows that globalization have insignificant relationship with financial market development. Moreover, inflation, real exchange rate and per capita income show a positive relationship with financial market development. Lastly, financial market development, interest rate, inflation rate, real exchange rate and real GDP shows a positive and significant relationship with per capita income of the region

In line with the above findings, the study recommends the government should enhance credit creation and promote low interest rate which will encourage investment. Also the financial market should be more liberalized to create more credit accessibilities and channel funds to strategic productive sectors in the economy which will go a long way to improve the impact of the sector. There should be adequate measures be taken to boost the export led and import substitution industries.

From the holistic study of previous literature and analysis obtained from this current study on globalization, financial market development and economic growth of West African countries, the study conclude that the result presented in this study are meaningful for policy making. The research equally concludes that globalization and financial market development, if well harnessed, have the possibilities of increasing the economic growth in the long-run.

5.4 Suggestions for Further Studies

This current study examines globalization, financial market development and economic growth of West African countries. However, there are some limitations encountered in the course of the study which future studies can actually improves on. The limitations spanned from the fact that the countries being studied are underdeveloped and lacked the necessary data needed for the analysis as suggested by theories. Some variables like domestic wage, technological change, percentage of credit creation to the manufacturing sector, total employment, poverty rate, human capital development index etc. are not available to the researcher.

Another limitation encountered in this study is incomplete data. Some countries do not have complete data and this may affect the conclusion of the research. Also, lack of information about

the target population of people that receives credit from banks also posed some limitations to this current study. To crown it all, the researcher was not able to dissect the study to include primary data due to inadequate finance.Owning to these constrains, the researcher acknowledges any inadequacies or anomalies that might be encountered here in.

Based on the limitations encountered and some current gap uncovered in this study, other researchers could as well explore the following areas for better understanding of the impact of globalization and financial market development in West African countries. They are as follows:

1. The probability impact of globalization on productivity in developing countries
2. The volatility nature of globalization and financial market in West African countries
3. Comparative impact of globalization, financial market development and economic growth in ECOWAS and EUROPIAN countries.
4. Globalization, financial market development and Unemployment in West African countries.
5. The shocks dynamics of financial market on economic performance in West African countries.

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APPENDIX

A

Summary statistics

```
. xtsum rgdp fd fdi pci gfcf lf to inf intr rexr
```

Variable		Mean	Std. Dev.	Min	Max	Observations
rgdp	overall	5.30e+12	1.02e+13	6.25e+09	6.98e+13	N = 440
	between		9.14e+12	1.40e+10	3.14e+13	n = 11
	within		5.36e+12	-1.09e+13	4.36e+13	T = 40
fd	overall	22.67898	13.55856	-.0019099	90.04463	N = 440
	between		7.36816	12.88152	31.49084	n = 11
	within		11.59172	-3.409997	85.73618	T = 40
fdi	overall	3.70e+08	1.12e+09	-7.39e+08	8.84e+09	N = 440
	between		7.19e+08	6581274	2.44e+09	n = 11
	within		8.82e+08	-2.81e+09	6.77e+09	T = 40
pci	overall	314313.5	313156.8	525.4869	1509192	N = 440
	between		316900.2	775.1984	1085540	n = 11
	within		81013.13	-43153.95	739607.9	T = 40
gfcf	overall	7.73e+11	1.55e+12	-1.02e+11	1.12e+13	N = 440
	between		1.22e+12	2.13e+09	4.33e+12	n = 11
	within		1.02e+12	-2.39e+12	7.68e+12	T = 40
lf	overall	3192405	1.07e+07	1.047043	5.74e+07	N = 440
	between		1.05e+07	15.9349	3.49e+07	n = 11
	within		3701439	-1.75e+07	2.57e+07	T = 40
to	overall	2930584	2686046	21.12435	1.33e+07	N = 440
	between		2348696	50.61606	7539567	n = 11
	within		1479371	-2481516	8664047	T = 40
inf	overall	13.75736	22.52373	-7.594284	165.6766	N = 440
	between		11.65364	4.051029	32.5734	n = 11
	within		19.5851	-23.43554	148.2498	T = 40
intr	overall	11.98979	8.665819	4.736667	62.83333	N = 440
	between		7.393358	5.895023	24.91098	n = 11
	within		5.028989	-4.530441	49.91214	T = 40
rexr	overall	59.15142	28.33704	.5467809	253.4922	N = 440
	between		12.13524	40.69926	79.61875	n = 11
	within		25.86129	-9.182572	243.7629	T = 40

.

APPENDIX B1

Unit Root at Level Form

RGDP

```
. xtunitroot llc rgdp

Levin-Lin-Chu unit-root test for rgdp
-------------------------------------

Ho: Panels contain unit roots               Number of panels  =     11
Ha: Panels are stationary                   Number of periods =     40

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 10.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t         10.0084
 Adjusted t*          14.7290        1.0000
------------------------------------------------------------------------------
```

.

Financial Development

```
. xtunitroot llc fd

Levin-Lin-Chu unit-root test for fd
-----------------------------------

Ho: Panels contain unit roots               Number of panels  =     11
Ha: Panels are stationary                   Number of periods =     40

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 10.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -4.6883
 Adjusted t*          0.5930        0.7234
------------------------------------------------------------------------------
```

.

INV

```
. xtunitroot llc gfcf

Levin-Lin-Chu unit-root test for gfcf
-------------------------------------

Ho: Panels contain unit roots               Number of panels  =     11
Ha: Panels are stationary                   Number of periods =     40

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 10.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t         0.4865
 Adjusted t*          0.5679        0.7149
------------------------------------------------------------------------------
```

.

LF

```
. xtunitroot llc lf

Levin-Lin-Chu unit-root test for lf
----------------------------------

Ho: Panels contain unit roots               Number of panels  =     11
Ha: Panels are stationary                   Number of periods =     40

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 10.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -0.2476
 Adjusted t*         -0.2890        0.3863
------------------------------------------------------------------------------
```

INF

```
. xtunitroot llc inf

Levin-Lin-Chu unit-root test for inf
-----------------------------------

Ho: Panels contain unit roots               Number of panels  =     11
Ha: Panels are stationary                   Number of periods =     40

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 10.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t         0.4215
 Adjusted t*          0.4919        0.6886
------------------------------------------------------------------------------
```

TO

```
. xtunitroot llc to

Levin-Lin-Chu unit-root test for to
----------------------------------

Ho: Panels contain unit roots               Number of panels  =     11
Ha: Panels are stationary                   Number of periods =     40

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 10.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t         0.8486
 Adjusted t*          0.9904        0.8390
------------------------------------------------------------------------------
```

RER

```
. xtunitroot llc rer

Levin-Lin-Chu unit-root test for rer
------------------------------------

Ho: Panels contain unit roots               Number of panels  =     11
Ha: Panels are stationary                   Number of periods =     40

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 10.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -1.0710
 Adjusted t*         -1.2500        0.1057
------------------------------------------------------------------------------
```

INTR

```
. xtunitroot llc intr

Levin-Lin-Chu unit-root test for intr
-------------------------------------

Ho: Panels contain unit roots               Number of panels  =     11
Ha: Panels are stationary                   Number of periods =     40

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 10.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -4.5715
 Adjusted t*         -1.0346        0.1504
------------------------------------------------------------------------------
```

FDI

```
. xtunitroot llc fdi

Levin-Lin-Chu unit-root test for fdi
------------------------------------

Ho: Panels contain unit roots               Number of panels  =     11
Ha: Panels are stationary                   Number of periods =     40

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 10.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -3.3358
 Adjusted t*          1.4627        0.9282
------------------------------------------------------------------------------
```

APPENDIX B2

UNIT ROOT AT FIRST DIFFERENCE

RGDP

```
. xtunitroot llc drgdp

Levin-Lin-Chu unit-root test for drgdp
--------------------------------------

Ho: Panels contain unit roots               Number of panels  =     11
Ha: Panels are stationary                   Number of periods =     39

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 10.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t         -7.8871
 Adjusted t*          -3.2674        0.0005
------------------------------------------------------------------------------
```

.

Financial Development

```
. xtunitroot llc dfd

Levin-Lin-Chu unit-root test for dfd
------------------------------------

Ho: Panels contain unit roots               Number of panels  =     11
Ha: Panels are stationary                   Number of periods =     39

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 10.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t       -13.1053
 Adjusted t*         -6.9999        0.0000
------------------------------------------------------------------------------
```

.

INV

```
. xtunitroot llc dgfcf

Levin-Lin-Chu unit-root test for dgfcf
--------------------------------------

Ho: Panels contain unit roots               Number of panels  =     11
Ha: Panels are stationary                   Number of periods =     39

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 10.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t       -10.6598
 Adjusted t*         -5.2065        0.0000
------------------------------------------------------------------------------
```

LF

```
. xtunitroot llc dlf

Levin-Lin-Chu unit-root test for dlf
------------------------------------

Ho: Panels contain unit roots               Number of panels  =     11
Ha: Panels are stationary                   Number of periods =     39

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 10.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t       -15.0799
 Adjusted t*         -9.5929        0.0000
------------------------------------------------------------------------------
```

INF

```
. xtunitroot llc dinf

Levin-Lin-Chu unit-root test for dinf
-------------------------------------

Ho: Panels contain unit roots               Number of panels  =     11
Ha: Panels are stationary                   Number of periods =     39

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 10.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t       -22.2729
 Adjusted t*        -15.2024        0.0000
------------------------------------------------------------------------------
```

TO

```
. xtunitroot llc dto

Levin-Lin-Chu unit-root test for dto
------------------------------------

Ho: Panels contain unit roots               Number of panels  =     11
Ha: Panels are stationary                   Number of periods =     39

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 10.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -5.1645
 Adjusted t*         -0.5274        0.2990
------------------------------------------------------------------------------
```

RER

```
. xtunitroot llc drer

Levin-Lin-Chu unit-root test for drer
-------------------------------------

Ho: Panels contain unit roots               Number of panels  =     11
Ha: Panels are stationary                   Number of periods =     39

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 10.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t       -15.3689
 Adjusted t*         -8.0483        0.0000
------------------------------------------------------------------------------
```

INTR

```
. xtunitroot llc dintr

Levin-Lin-Chu unit-root test for dintr
--------------------------------------

Ho: Panels contain unit roots               Number of panels  =     11
Ha: Panels are stationary                   Number of periods =     39

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 10.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t       -14.0068
 Adjusted t*         -8.4498        0.0000
------------------------------------------------------------------------------
```

FDI

```
. xtunitroot llc dfdi

Levin-Lin-Chu unit-root test for dfdi
-------------------------------------

Ho: Panels contain unit roots               Number of panels  =     11
Ha: Panels are stationary                   Number of periods =     39

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 10.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t       -16.9381
 Adjusted t*         -8.0014        0.0000
------------------------------------------------------------------------------
```

APPENDIX C

COINTEGRATION TEST

Model I

```
. xtwest rgdp fd gfcf lf inf to, lags(2) leads(0 1)

Calculating Westerlund ECM panel cointegration tests.........

Results for H0: no cointegration
With 11 series and 5 covariates
Average AIC selected lag length: 2
Average AIC selected lead length: 1
```

Statistic	Value	Z-value	P-value
Gt	-0.772	4.651	1.000
Ga	-1.069	4.602	1.000
Pt	1.244	6.124	1.000
Pa	0.522	3.568	1.000

Model II

```
. xtwest inv rgdp fd lf inf to fdi, lags(2) leads(0 1)

Calculating Westerlund ECM panel cointegration tests.........

Results for H0: no cointegration
With 11 series and 6 covariates
Average AIC selected lag length: 2
Average AIC selected lead length: 1
```

Statistic	Value	Z-value	P-value
Gt	-0.659	5.743	1.000
Ga	-0.357	5.368	1.000
Pt	-4.587	2.064	0.981
Pa	-0.868	3.462	1.000

Model III

```
. xtwest fd fdi intr inf rexr pci to, lags (2) leads(0 1)

Calculating Westerlund ECM panel cointegration tests.........

Results for H0: no cointegration
With 11 series and 6 covariates
Average AIC selected lag length: 2
Average AIC selected lead length: 1
```

Statistic	Value	Z-value	P-value
Gt	-1.568	2.791	0.997
Ga	-0.324	5.380	1.000
Pt	-2.507	3.807	1.000
Pa	-0.428	3.628	1.000

Model IV

```
. xtwest pci fd intr inf rexr lrgdp, lags(2) leads(0 1)

Calculating Westerlund ECM panel cointegration tests.....

Results for H0: no cointegration
With 11 series and 5 covariates
Average AIC selected lag length: 2
Average AIC selected lead length: .91
```

Statistic	Value	Z-value	P-value
Gt	0.595	9.106	1.000
Ga	-0.086	5.027	1.000
Pt	6.031	10.042	1.000
Pa	0.951	3.746	1.000

APPENDIX D

HAUSMAN TEST FOR FIXED AND RANDOM EFFECT

Model 1

```
. hausman fixed random

Note: the rank of the differenced variance matrix (4) does not equal the number of coefficients being tested (6); be sure this is what you
      expect, or there may be problems computing the test.  Examine the output of your estimators for anything unexpected and possibly
      consider scaling your variables so that the coefficients are on a similar scale.
```

	Coefficients (b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
llrgdp	.958416	.9922015	-.0337854	.0115375
fd	-.0005243	-.0005193	-4.98e-06	.0001069
linv	.0042594	.0043	-.0000405	.00165
lf	3.37e-09	7.47e-10	2.62e-09	7.26e-10
inf	-.0003065	-.0002442	-.0000624	.0000457
to	1.06e-08	2.50e-09	8.14e-09	2.88e-09

```
                b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                        =       11.76
              Prob>chi2 =      0.0192
```

Model II

```
. hausman fixed random

Note: the rank of the differenced variance matrix (3) does not equal the number of coefficients being tested (6); be sure this is what you
        expect, or there may be problems computing the test.  Examine the output of your estimators for anything unexpected and possibly
        consider scaling your variables so that the coefficients are on a similar scale.

                 ---- Coefficients ----
              |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
              |     fixed        random       Difference          S.E.
--------------+----------------------------------------------------------------
       llrgdp |     1.839376     1.512139        .3272372        .2019283
           fd |     .0039301     .0029901        .0009401               .
           lf |    -5.62e-08    -3.72e-08       -1.90e-08        1.01e-08
          inf |    -.0067603    -.0079095        .0011492               .
           to |     4.23e-07     4.35e-07       -1.20e-08        4.20e-08
          fdi |     1.70e-10     1.82e-10       -1.17e-11        1.51e-11
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(3) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =    -0.56    chi2<0 ==> model fitted on these
                                        data fails to meet the asymptotic
                                        assumptions of the Hausman test;
                                        see suest for a generalized test
```

Model III

```
. hausman random fixed

Note: the rank of the differenced variance matrix (3) does not equal the number of coefficients being tested (6); be sure this is what you
        expect, or there may be problems computing the test.  Examine the output of your estimators for anything unexpected and possibly
        consider scaling your variables so that the coefficients are on a similar scale.

                 ---- Coefficients ----
              |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
              |    random        fixed        Difference          S.E.
--------------+----------------------------------------------------------------
       llrgdp |     1.512139     1.839376       -.3272372               .
           fd |     .0029901     .0039301       -.0009401         .000875
           lf |    -3.72e-08    -5.62e-08        1.90e-08               .
          inf |    -.0079095    -.0067603       -.0011492        .0006024
           to |     4.35e-07     4.23e-07        1.20e-08               .
          fdi |     1.82e-10     1.70e-10        1.17e-11               .
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(3) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =        0.56
                Prob>chi2 =      0.9061
                (V_b-V_B is not positive definite)
```

Model IV

```
. hausman random fixed
```

	Coefficients (b) random	(B) fixed	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
fd	28.49225	-14.5012	42.99345	18.7289
intr	-1259.116	-1378.331	119.2147	.
inf	381.9061	372.1925	9.713676	14.99526
rexr	339.4959	361.1399	-21.64395	.
lrgdp	54582.64	51600.02	2982.616	.

```
                b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =         4.08
                Prob>chi2 =       0.5378
                (V_b-V_B is not positive definite)
```

APPENDIX E

REGRESSION RESULT

MODEL 1

```
. xtmixed lrgdp llrgdp fd linv lf inf to

Mixed-effects ML regression                     Number of obs      =       428

                                                Wald chi2(5)       =         .
Log likelihood =  674.90493                     Prob > chi2        =         .
```

lrgdp	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
llrgdp	.9922015	.0025074	395.71	0.000	.9872871	.9971159
fd	-.0005193	.0001805	-2.88	0.004	-.0008732	-.0001655
linv	.0043	.0017356	2.48	0.013	.0008982	.0077017
lf	7.47e-10	2.64e-10	2.83	0.005	2.29e-10	1.27e-09
inf	-.0002442	.0001172	-2.08	0.037	-.0004738	-.0000145
to	2.50e-09	9.85e-10	2.54	0.011	5.68e-10	4.43e-09
_cons	.1455575	.0368006	3.96	0.000	.0734297	.2176853

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
sd(Residual)	.0499957	.0017088	.0467562	.0534596

MODEL 2

```
. xtmixed linv fd pci rexr lf inf to intr

Mixed-effects ML regression                     Number of obs      =       439

                                                Wald chi2(7)       =    515.21
Log likelihood = -1006.3341                     Prob > chi2        =    0.0000
```

linv	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
fd	-.0088094	.0091017	-0.97	0.333	-.0266483	.0090295
pci	5.02e-06	4.14e-07	12.13	0.000	4.21e-06	5.83e-06
rexr	-.0150021	.0045122	-3.32	0.001	-.0238457	-.0061584
lf	1.77e-07	1.26e-08	14.06	0.000	1.52e-07	2.01e-07
inf	-.0610746	.0052405	-11.65	0.000	-.0713458	-.0508035
to	3.04e-07	4.66e-08	6.51	0.000	2.12e-07	3.95e-07
intr	.0862103	.0148294	5.81	0.000	.0571453	.1152753
_cons	23.00176	.4007327	57.40	0.000	22.21634	23.78719

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
sd(Residual)	2.395026	.0808282	2.241732	2.558804

MODEL 3

```
. xtmixed fd fdi intr inf rexr pci to

Mixed-effects ML regression                     Number of obs      =       440

                                                Wald chi2(6)       =     63.36
Log likelihood = -1741.3257                     Prob > chi2        =    0.0000
```

fd	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
fdi	-7.87e-10	6.54e-10	-1.20	0.229	-2.07e-09	4.95e-10
intr	-.3327405	.0761477	-4.37	0.000	-.4819873	-.1834938
inf	.0727395	.027446	2.65	0.008	.0189463	.1265326
rexr	.0584303	.0259805	2.25	0.025	.0075095	.1093511
pci	.0000134	2.09e-06	6.39	0.000	9.27e-06	.0000175
to	-1.73e-08	2.28e-07	-0.08	0.939	-4.65e-07	4.30e-07
_cons	18.35174	1.984063	9.25	0.000	14.46304	22.24043

MODEL 4

```
. xtmixed pci fd intr inf rexr lrgdp

Mixed-effects ML regression                     Number of obs      =       440

                                                Wald chi2(5)       =    370.47
Log likelihood = -6057.4094                     Prob > chi2        =    0.0000
```

pci	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
fd	5540.073	830.3282	6.67	0.000	3912.659	7167.486
intr	9203.286	1341.213	6.86	0.000	6574.557	11832.02
inf	2001.863	507.5253	3.94	0.000	1007.132	2996.595
rexr	553.5521	396.6925	1.40	0.163	-223.9508	1331.055
lrgdp	67764.98	4860.901	13.94	0.000	58237.78	77292.17
_cons	-1858386	134749.3	-13.79	0.000	-2122490	-1594282

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
sd(Residual)	230475.8	7769.337	215740.3	246217.7

APPENDIX F

Test for Time Fixed Effect

Model 2

```
. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

        lpci[country,t] = Xb + u[country] + e[country,t]

        Estimated results:
                     |       Var     sd = sqrt(Var)
             ---------+------------------------------
                lpci |    3.870008       1.967234
                   e |    .0166537       .1290492
                   u |    1.984473       1.408713

        Test:   Var(u) = 0
                             chibar2(01) =  7521.59
                          Prob > chibar2 =   0.0000

.
```

Model 4

```
Breusch and Pagan Lagrangian multiplier test for random effects

        linv[country,t] = Xb + u[country] + e[country,t]

        Estimated results:
                     |       Var     sd = sqrt(Var)
             ---------+------------------------------
                linv |    12.05192       3.471587
                   e |    1.031366       1.015562
                   u |    .5680206       .7536714

        Test:   Var(u) = 0
                             chibar2(01) =   501.13
                          Prob > chibar2 =   0.0000
```

Appendix G

Testing For Random Effects: Breusch-Pagan Lagrange Multiplier (LM)

```
. xttest2

Correlation matrix of residuals:

            __e1     __e2     __e3     __e4     __e5     __e6     __e7     __e8     __e9    __e10    __e11
 __e1   1.0000
 __e2   0.1445   1.0000
 __e3   0.0604   0.2953   1.0000
 __e4  -0.0750  -0.1949   0.0159   1.0000
 __e5  -0.1611  -0.0464   0.0927   0.0022   1.0000
 __e6   0.0554  -0.0654   0.2733   0.1782  -0.0492   1.0000
 __e7   0.0829   0.4113   0.1079   0.0040  -0.0376  -0.0585   1.0000
 __e8  -0.0559   0.5433   0.4629   0.1308  -0.0708  -0.1461   0.3804   1.0000
 __e9   0.1303  -0.0559  -0.2753   0.0170  -0.0371  -0.1211   0.1132  -0.0239   1.0000
__e10   0.2141   0.3861   0.2377  -0.4011  -0.0800   0.0574   0.1822   0.0485  -0.0896   1.0000
__e11   0.1639   0.1264  -0.1273   0.0787  -0.0249  -0.0704  -0.1305   0.0976   0.0034   0.0473   1.0000

Breusch-Pagan LM test of independence: chi2(55) =    71.921, Pr = 0.0624
Based on 38 complete observations over panel units
```

```
. xttest2

Correlation matrix of residuals:

           __e1     __e2     __e3     __e4     __e5     __e6     __e7     __e8     __e9    __e10    __e11
 __e1   1.0000
 __e2   0.4276   1.0000
 __e3  -0.8934  -0.3282   1.0000
 __e4  -0.7713  -0.4262   0.6862   1.0000
 __e5  -0.5931  -0.8035   0.5897   0.7107   1.0000
 __e6  -0.3564  -0.3967   0.4321   0.5068   0.5671   1.0000
 __e7   0.6476   0.4355  -0.7127  -0.6410  -0.6836  -0.5495   1.0000
 __e8  -0.8837  -0.3887   0.9122   0.8875   0.6945   0.5073  -0.7027   1.0000
 __e9  -0.4781   0.2224   0.5273   0.0250  -0.1220   0.0759  -0.2004   0.2745   1.0000
__e10  -0.4553   0.3367   0.5231   0.0436  -0.2254  -0.2564  -0.0208   0.2957   0.7100   1.0000
__e11  -0.5439   0.3518   0.5536   0.2313  -0.1556   0.0414  -0.3102   0.4211   0.7668   0.6871   1.0000

Breusch-Pagan LM test of independence: chi2(55) =   618.199, Pr = 0.0000
Based on 40 complete observations over panel units
```

Appendix H

Testing For Cross-Sectional Dependence/Contemporaneous Correlation

Model 1

```
F test that all u_i=0:     F(10, 411) =     2.13             Prob > F = 0.0213

. xtcsd, pesaran abs


Pesaran's test of cross sectional independence =     2.298, Pr = 0.0215

Average absolute value of the off-diagonal elements =     0.137

.
```

Model 3

```
F test that all u_i=0:     F(10, 424) =   344.96             Prob > F = 0.0000

. xtcsd, pesaran abs


Pesaran's test of cross sectional independence =     1.870, Pr = 0.0614

Average absolute value of the off-diagonal elements =     0.473

.
```

Appendix I

Heteroscedasticity

```
. xttest3

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (11)  =    1.7e+05
Prob>chi2 =      0.0000


.
```

Appendix J

Correlation Test

Model 1

```
. xtserial lrgdp llrgdp fd linv lf inf to


Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      10) =     64.409
           Prob > F =      0.0000


.
```

Model 3

```
. xtserial lrgdp llrgdp fd linv lf inf to

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
     F(  1,       10) =      64.409
            Prob > F =       0.0000

. xtserial pci fd intr inf rexr logrgdp

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
     F(  1,       10) =      19.903
            Prob > F =       0.0012

.
```