Financial Deepening and Economic Growth Dynamics: Empirical Evidence from the West African Monetary Zone

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Abstract—This paper empirically examines the dynamic relationship between financial deepening and economic growth in a monetary union. We find positive but weak evidence of impacts of financial deepening on growth for Gambia, Gabon and Sierra Leone. There is no evidence of any positive significant impact for Ghana and Nigeria. We argue that, the weak evidence between financial deepening and economic growth can be a consequence of the inability of assessing credit (long-term loans), credit worthiness, lack of information and low level of bank deposits by the private sector despite the improvement in the financial sector.

Keywords—Financial deepening, economic growth, dynamics, innovation accounting.

I. INTRODUCTION

OVER the years, much debate has been made on both the theoretical and empirical evidences on the relationship between financial development and economic growth. Many theorists such as [37], [32], [30], [26] have argued extensively on their views regarding financial development and economic growth. For instance, [37] argued that there is a positive relationship between financial development and economic growth. He noted that, channels through which financial developments could lead to economic growth may be supply-leading finance or demand following. Supply-leading finance may entail transfer of resources from the traditional (less developed) sectors of the economic to the modern sectors (developed) of the economy and also to encourage investors to invest in the modern sectors of the economy. This may lead to capital available for investors in the high growth sectors of the economy. On the demand side, he argues that in the real economy, the development of the financial institution is as a result of the demand by investors. Hence economic growth creates a demand for financial development. This view is supported by [38], who argues that finance does not lead to economic growth but rather demand of financial institution by investors lead to economic growth as a result of higher demand for the financial services. Therefore, increase in demand for financial services leads to openness of other sectors and economic growth.

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Reference [26] argued that development of the financial system in any country will lead to economic growth. The argument is based on the premise that efficient allocation of financial resources to entrepreneurs will lead to development of innovative activities and creation of new jobs. They also argued that financial institutions can also act as an advisory body to encourage entrepreneurs to invest in productive activities and high-growth sectors of the economy. Reference [26] argued that regulations by the government such as deposit rate ceiling, interest rates, and high reserve requirement hinder financial development and economic growth in the long-run. Contrary to views, [30] thinks that there is no relationship between finance and economic growth. He thinks that economics has laid too much emphasis on the importance of finance in economic growth. He argues that development of financial sector can stunt economic growth when uncertainties in the financial markets on the value of securities discourage investors from investing. Also the introduction of financial tools may discourage savers and this will reduce the rate of economic growth.

On the empirical side, quite a substantial number of studies have been done on the impacts of financial development and economic growth; the results from these studies have generated mixed conclusions. For instance, [6] investigated the interrelationship that exists among foreign direct investment (FDI), economic growth, and stock of domestic capital in Malaysia. They used the Generalised Method of Moments (GMM) to estimate the empirical model based on annual data from 1970-2007. The findings are that the financial development in Malaysia positively affects the level of domestic stock market and that leads to economic growth. However, the direct impact of financial development on economic growth proved statistically insignificant. Reference [40] also carried out an empirical investigation on the effect of financial development on economic growth on 286 Chinese cities using data set from 2001-2006 employing GMM. Evidence indicates that there is a positive impact of financial development on economic growth. The results interestingly reveal that the size and depth of a financial sector spurs economic growth. The research also shows that contrary to many views, government owned banks as in the case of China hinders economic growth because of government regulations.

Evidence also provided by [25] on the causality between financial development and economic growth in 15 countries of Middle East and North African (MENA) show that there is no clear evidence that financial development causes economic

growth in the MENA countries although the results are country specific. The results also support the demand-following and the supply-leading hypothesis postulated by [37]. Contrary to the findings of [40], [25] suggests that the government owned ownership of bank which is operated in the Islamic states hinders economic growth. Also [33] conducted a study on the casual relationship between financial development and economic growth in 21 African countries using the bootstrap Panel Granger causality analysis. Evidence supports the supply-leading hypothesis of financial development to growth in South Africa, Benin and Sierra Leon. However, in Nigeria, [33] explained that there was an evidence of demand-following hypothesis of economic growth. The overall result of the experiment shows that there is no evidence of finance-led growth in all the 21 countries. Hence liberalization of the financial sector, international trade, has little or no impact on economic growth.

Reference [34] provides evidence that financial development leads to economic growth in the long run but not in the short run in Argentina. Reference [29] used the Generalised Method of Moment (GMM) to investigate the role of financial development on economic growth in Taiwan, Korea and Japan. Finance aggregate in Taiwan has positive effect on economic growth but has a negative effect in other countries (Japan and Korea). The stock market development in Taiwan has a positive effect on economic growth of Taiwan. Finally, the deregulation of the foreign exchange in the three countries had a negative effect on economic growth in the economies of the three countries while the effect of capital inflow is negative. [16], give evidence that financial development does not cause economic growth, contrary to evidence from most countries in Asia such as Korea and Thailand. References [31], [20] provided evidence particularly in Sub-Saharan Africa indicating that, financial deepening has had little or no effect on economic growth.

Other studies such as [1], [39] provide evidence to show that although financial deepening have had positive impacts of economic growth, the evidence are quite weak. However, [15], [39], [2], [23] have given empirical evidence to show that, financial deepening has had strong positive impacts on economic growth particularly in developed economies and in some countries, it has contributed immensely to the reduction of poverty. Contrary to these views some studies such as [5], [27], [35] show that, the impacts are both ways and or may depend on country specific characteristics and therefore, cannot be generalized. As an example, [5], asserts that financial policies are country specific and the success of the policies depends on the stability, efficiency and the implementing institutions.

In view of these mixed results, it is important that research aimed at investigating financial deepening and the impacts on economic growth focus on country specific policies to uniquely propose policies that best fit the situations of the economies under investigation. Particularly for developing economies like that of the members of WAMZ who are eager to develop, appropriate policies that identify with the explicit circumstances of the macroeconomic structure should be of major concern. In this paper, we aim to investigate the dynamics between financial deepening and economic growth. In the first place, we note that, although much work has been done on the finance-growth relationship, not much of these studies focus on the dynamics between these economic variables. Secondly, we are not aware of any study that targets a monetary regional bloc or union. This particularly, is quite unique to this study due to the fact that, for almost 15 years now, the WAMZ economies have made all efforts to align their macroeconomic policies in order to adopt a common currency. The idea is that, although reforms in the financial sector may be implemented by different economies in the WAMZ, they may be guided by one same principle; improving the macroeconomic conditions to achieve a common goal. Therefore, in some way, these economies may tend to possess some similar macroeconomic characteristics worth investigating. In this paper, we employ innovating accounting matrix techniques to investigate the dynamics between financial development and economic growth.

The rest of the paper is organized as follows; Section II presents an overview of the financial sector reforms among the WAMZ member countries. Section III presents the methodological framework and data. Sections IV and V present the empirical estimations and policy recommendations from analysis of the results respectively.

II. FINANCIAL SECTOR REFORMS IN THE WAMZ

WAMZ just like most economies in Africa is faced with numerous economic challenges. Some of these challenges are high inflation rates, high rate of unemployment, increasing poverty, low economic growth, financial sector depression, negative terms of trade etc. According to [3], the two main causes of economic crises in Africa are: inadequate institutional capacity and domestic policy failures. In an effort to improve the macroeconomic performance of the country, most of the WAMZ economies introduced for instance the Structural Adjustment Programme (SAP) between 1983 and 1994. One of the main agenda for the SAP was a reform of the financial sector in order to increase efficiency, enhance competitiveness which will lead to financial deepening. The reform in the financial sector was designed to enable the banking industry to support economic growth and development of the nation and become a major player in the African and International market [28].

As part of the financial sector reforms, free entry and exit into the financial sector was encouraged. According to [7], financial development should be characterised by effective and efficient allocation of financial resources to prioritize real sector development. Another major financial reform in the West African economies is the financial adjustment implementation program (FINSAP) alongside the SAP. As part of the FINSAP, governments completely deregulated interest rates. In addition, selective guidelines were eliminated accompanied with open market operations. Indirect monetary controls were also encouraged, [11]. Part of the reforms also included licensing of new banks, establishment of stock exchange, formalizing non-banking financial institutions

through regulations and giving more supervisory role to the central banks. Results of these reforms were felt in most of the economies although this led to increases in government deficit.

In Nigeria, one of the major reforms came through the establishment of the Nigerian Deposit Insurance Corporation (NDIC). This idea was to protect banks from unrestricted demand for cash that could cripple the bank activities, disrupt the payment system and bring about a general macroeconomic set back and in addition protect small depositors from an event of a bank failure [24]. In 1992, there was a total removal of credit ceiling on banks by the Central Bank of Nigeria. Banks were assumed healthy when they meet the cash reserve requirement, minimum paid up capital, sound management requirement. Financial deregulation in Nigeria led to an increase in the number of commercial banks in Nigeria from 14 in 1970 to 29 in 1986 after the reforms. In 1993, the number of commercial banks increased to 66 (128%). It however dropped to 54 in 1998 because of the bank failures that year. In 2004, it increased to 89 [13]. Contrary to financial development theories on deregulation, the financial deepening ratio worsened after deregulation moving from 26.7 percent before the reforms to 22.8 percent after the reforms. This shows that Nigeria is yet to achieve its main purpose of financial deepen that led to the reforms. However, Nigerians improved their savings after the deregulation from 7.1 percent to 12.6 percent. The intensity of cash fell from 23.0 percent to 15.7 percent. This is due to the improvement of credit facilities i.e. ATM machines etc. On the other hand, interest rate spreads worsened from the pre-reform period which stood at 1.8 percent to 10.5 percent after the reforms [14].

Prior to the reforms in Ghana, foreign banks were too narrow and restricted their loans to the productive sectors. Secondly, the industrial and agricultural sectors required special finance and the foreign banks were not willing to give them the loans [12]. In addition, the Ghana financial sector was characterised by government ownership, financial repression and failed to enhance economic growth such as agriculture and manufacturing. In Ghana, there has been significant improvement in various financial growths since the reforms of 1988. First, the private sector credit in GDP terms increased from 3.12 percent during the period of 1981-1990 to 15.71 percent in 2010. An evidence of financial deepening also is depicted by the increase of broad money supply/ GDP from 16.50 percent during the period of 1981-1990 to 29.79 percent in 2010 after years of implementation of the reforms. Also increase in total credit available for the private sector increase from 14.74 percent during the pre-reform era to 54.60 percent in 2010 after years of implementation of the reforms. The deregulation, foreign credit investment in the banking sector, efficiency and effective banking reforms increased the total bank deposit and total credit after the reforms. This also shows that the saving culture of the citizens increased and automatically led to increase in investment [9], [22].

For Gambia, liberalization of the financial sector was as a result of the government owned commercial bank financial crisis in the late 1970s and early 1980s. The crisis was as a result of non-performing loans given to the private sector and their inability to repay the loans. This lead to the financial sector reforms in 1985. The reforms included elimination of all interest rate controls, subsided lending rate for farmers (agricultural products was the major export of Gambia), introduction of auction system for issuance of treasury bills, indirect system of monetary controls were introduced through open market operations, removal of credit ceiling following the adoption of open market operation and the government owned Gambian Commercial Bank (GCBD) was privatized in 1992 to enhance efficiency. All these policy reforms were intended to increase the total level of savings, increase credit to the private sectors, increase investment and economic growth. Evidence from The Gambian sources and IMF estimates show that domestic credit provided by the banking sector reduced from 44.34% in the pre-reform era to 15% after the reforms. Also the credit provided to the private sector fell from 20.51% before the liberalization to 12.69% after liberalization. The decrease in bank lending to the private sector was as a result of crowding out by the financial sector whose domestic borrowing fell in the mid-1980s. High interest rate suppressed the demand for loan and reduced investment in the private sector. This can also be attributed to the inability of the citizens to save. The high level of poverty made it impossible to save mainly because income was basically consumed. This reduced the total credit available for the private sector despite liberalization [22].

In Gabon, the development of the financial sector is marred by lack of access to financial facilities by the citizens. In the year 2011, only about 131 out of every 1000 adults were bank depositors. In an attempt to support the development of finance, the government of Gambia has recently supported the development of the financial sector by creating specialized agencies to promote private investment. The commercial banking sector in Gabon consists of nine commercial banks. However, the bank growth in Gambia is constrained by the small size of the non-oil economy [22].

The development of commercial banking in Sierra Leone started in the mid-1980s. The deregulation of the financial sector caused the existence of thirteen (13) new commercial banks. Prior to the time, only the [10] existed. The commercial banking sector in Sierra Leone has not lived up to its standards, mainly because only about two million account holders have commercial bank accounts in commercial bank and majority of them are governments workers who withdraw all their salaries two days after the payment is made (BSL report). The implications for saving and investment in the economy are therefore an issue to be interrogated. Evidence available from IMF (International Financial statistics) showed that, nominal deposits and lending rates increased in the beginning of the reforms, increasing by twice from 15.0% to 34.6% (1982-1990). Overall, private sector share increased from 15.4% to 22.4% (1982-1990).
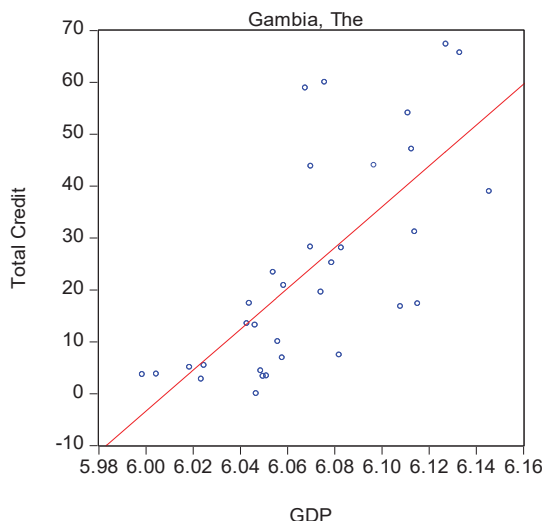
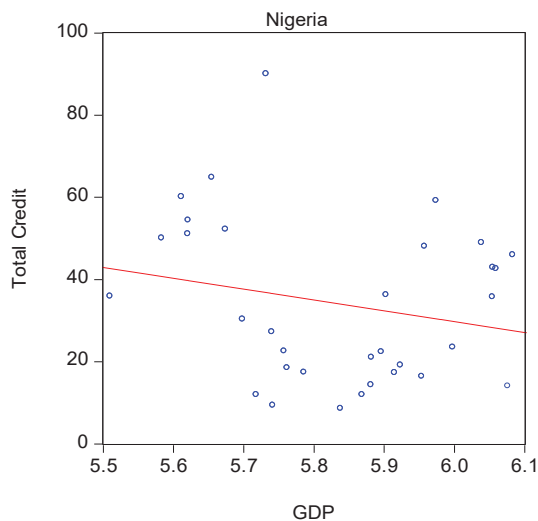Fig. 1 Scatter plots of Total Credit and Real GDP for Gambia [22]

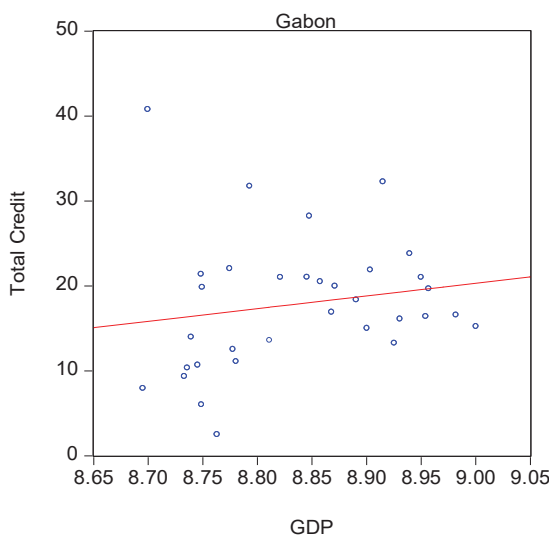Fig. 2 Scatter plots of Total Credit and Real GDP for Gabon [22]

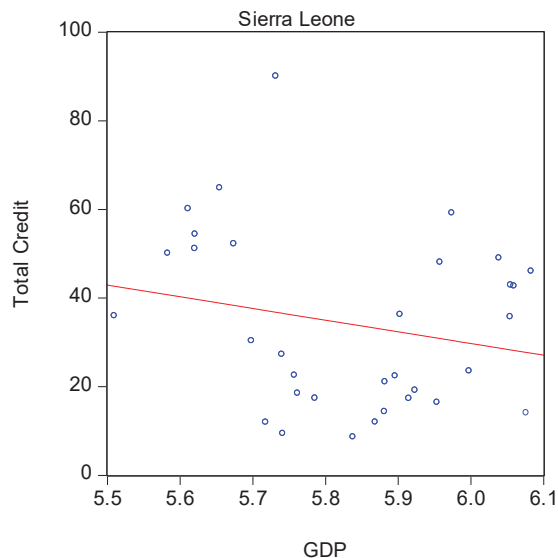Fig. 3 Scatter plots of Total Credit and Real GDP for Ghana [22]

Fig. 4 Scatter plots of Total Credit and Real GDP for Nigeria [22]

Fig. 5 Scatter plots of Total Credit and Real GDP for Sierra Leone [22]

III. ECONOMETRIC APPROACH AND DATA

We first describe the data employed in the model below. All but one country in the WAMZ, that is, Liberia is excluded from this paper due to the inability to obtain data. In this paper, we use total credit, that is, total domestic credit, as a proxy for financial deepening because it involves the mobilization of savings to the private sector for investment. It includes all credit provided to the private sector through the commercial banks. At best, it is the most reliable data that could be obtained for all five countries. Real per capita income is used as a proxy for economic growth. Other variables include inflation rates, interest rates, money and quasi (M2) money, investment captured by FDI inflows, labour and trade openness. Data employed spans from 1980 to 2012 and obtained from [22].

For our empirical model, we estimate a vector error-correction model of the form

$$\Delta Y_t = \gamma_0 + \sum_{i=1}^{m} \gamma_1 \Delta Y_t + \gamma_2 ECT_{t-1} + \varepsilon_{it}$$

where Y_t is a vector of the natural log of the variables, Δ is the difference operator, γ_0 is a vector of the constant terms, γ_1 is a 4×4 matrix of the coefficients of the logged variables, γ_2 is a vector of the coefficients of the lagged error correction terms, and ε_{it} is the vector of the *iid* error terms. The innovation accounting, that is, the impulse response and variance compositions are generated after estimating the model.

IV. ECONOMETRIC RESULTS

A. Unit Roots Tests

The first and most appropriate thing to do when dealing with time series variables is to ensure that there is no mean reverting process in the series modeled by checking the properties of the data. We use the ADF test to identify the order of integration and the presence of unit roots in the series. This is necessary to identify the characteristics of the variables employed. From Tables I-III, we note that, with the exception of inflation and money for all the countries, the rest of the variables under investigation are stationary after taking the first difference. This allows us to sort out the long and short run effects in our estimations. Tables IV-VI report the Johansen cointegration test for various countries. We note from the trace statistics that there at least four, six, five, four and four cointegrating equations for Ghana, Gabon, Ghana, Nigeria and Sierra Leone respectively. The results establish the possibilities of long-run relationship among the variables. Vector error-correction is appropriate to determine the short and long run dynamics and the speed of adjustments to equilibrium.

TABLE I
UNIT ROOT TESTS FOR THE GAMBIA AND GABON

Variables	Gambia Level	Gambia Difference	Gabon Level	Gabon Difference
E-Growth	-2.6891	-6.5331***	-2.6742	-5.6365***
T/Credit	-0.6445	-6.6712***	-2.3509	-4.9186***
Labour	-2.9939	-3.5161*	-2.4783	-6.8266***
Inflation	-3.5699**	-7.4901***	-4.5944***	
Int. Rate	-2.7409	-3.9949**	-0.8083	-5.8702***
Openness	-1.9242	-6.3742***	-3.0972	-8.3719***
Investment	-2.1272	-5.4877***	-2.5988	-7.5142***
Money	-6.8373***		-4.4084***	

***, **, and * Indicates 1%, 5% and 10% Significance Level Respectively

TABLE II
UNIT ROOT TESTS FOR GHANA AND NIGERIA

Variables	Ghana Level	Ghana Difference	Nigeria Level	Nigeria Difference
E-Growth	-0.2026	-5.8327***	-0.5215	-7.4312***
T/Credit	-2.6162	-5.91702***	-3.0581	-6.6599***
Labour	-2.9951	-4.1715**	-1.3596	-5.3657**
Inflation	-6.2617***		-3.3088***	-5.5437
Int. Rate	-1.7752	-5.5258***	-2.2559	-4.4399***
Openness	-1.7834	-4.9151***	-2.7773	-7.4623***
Investment	-2.6134	-4.4092***	-4.8868***	
Money	-5.3696***		-3.4304*	-7.7091***

***, **, and * Indicates 1%, 5% and 10% Significance Level Respectively

TABLE III
UNIT ROOT TESTS FOR SIERRA LEONE

Variables	Sierra Leone Level	Sierra Leone Difference
E-Growth	-0.5215	-7.4313***
T/Credit	-3.0581	-6.6599***
Labour	-1.3596	-5.3657***
Inflation		
Int. Rate	-2.2558	-4.4399***
Openness	-4.4399***	
Investment	-4.8867***	
Money	-3.2124*	-7.7091***

***, **, and * Indicates 1%, 5% and 10% Significance Level Respectively

TABLE IV
COINTEGRATION TESTS FOR THE GAMBIA AND GABON

No. of C.E	Gambia Eigen Value	Gambia Trace Stat	Gabon Eigen Value	Gabon Trace Stat
R≤0	0.964908**	309.4041**	0.99413**	444.5042**
R≤1	0.889855**	205.561**	0.918641**	285.229**
R≤2	0.786911**	137.1764**	0.895695**	207.4537**
R≤3	0.707845*	89.24897*	0.828764**	137.3802**
R≤4	0.492581	51.10438	0.683638**	82.67411**
R≤5	0.417674	30.07339	0.555494*	46.99724*
R≤6	0.246046	13.31093	0.367049	21.86269

***, **, and * Indicates 1%, 5% and 10% Significance Level Respectively

TABLE V
COINTEGRATION TESTS FOR THE GHANA AND NIGERIA

No. of C.E	Ghana Eigen Value	Ghana Trace Stat	Nigeria Eigen Value	Nigeria Trace Stat
R≤0	0.978964**	353.1934**	0.939432**	284.8801**
R≤1	0.887547**	233.4869**	0.838837**	197.9567**
R≤2	0.838334**	165.745**	0.768706**	141.3711**
R≤3	0.755059**	109.256**	0.755245*	95.98511*
R≤4	0.623227*	65.64712*	0.505894	52.35263
R≤5	0.364331	35.38766	0.358182	30.49744
R≤6	0.309461	21.34228	0.296297	16.75049

***, **, and * Indicates 1%, 5% and 10% Significance Level Respectively

TABLE VI
COINTEGRATION TESTS FOR THE SIERRA LEONE

No. of C.E	Sierra Leone Eigen Value	Sierra Leone Trace Stat
R≤0	0.928647**	238.53**
R≤1	0.797675**	156.6862**
R≤2	0.7398**	107.1519**
R≤3	0.616328*	65.41642*
R≤4	0.507337	35.71942
R≤5	0.274887	13.77358
R≤6	0.115631	3.809314

***, **, and * Indicates 1%, 5% and 10% Significance Level Respectively

B. Long and Short-run Dynamics

The results from Tables VII-IX show the long run and short run effect of financial deepening on economic growth. The long run estimates of Gambia and Sierra Leone are all significant at various levels. For Gambia; labour, inflation rate, interest rate and money supply have a negative effect on economic growth. However, total credit, openness to trade and FDI have little or no impact of economic growth in Gambia. The results in Gabon show that interest rate, openness to trade and money supply have a minimal negative effect to the economy, remaining variables have no meaningful impact on economic growth. However, interest rate and FDI are statistically insignificant in the model. The long run effects of the total credit, labour and inflation on economic growth are negative in Ghana with remaining variables having no impact on growth. Interest rate and FDI are statistically insignificant at all levels in Ghana. In Nigeria, the long run effect of total credit, inflation and money supply on growth are negative. The results however show that a percentage increase in labour will increase GDP by 3.9 percent in Nigeria. We find little or no positive impact of growth in the other variables. Also in Nigeria, total credit and money supply are insignificant. In Sierra Leone, an increase in labour by one percent will lead to an increase in GDP by 2.2 percent. Other variables such as total credit, interest rate, FDI money, trade have little or marginally negative impact on economic growth.

TABLE VII
LONG AND SHORT-RUN DYNAMICS FOR THE GAMBIA AND GABON

	Gambia		Gabon	
Long-Run	Dependent variable Real GDP			
T/ Credit	0.001673	[1.85238]*	0.00494	[4.29829]***
Labour	-8.66993	[-4.40019]***	0.28798	[6.94059]***
Inflation	-0.0048	[-2.56656]**	0.01583	[14.7707]***
Int. Rate	-0.02125	[-4.88425]***	-0.00161	[-0.60000]
Trade	0.001784	[2.64456]***	-0.01011	[-10.3163]***
FDI	0.013993	[3.01287]***	0.00073	[0.25562]
Money	-0.02446	[-15.1974]***	-0.00404	[-4.83876]***
Short Run				
T/ Credit	0.000383	[0.22491]	-0.00379	[-1.82618]*
Labour	2.375726	[2.22947]**	2.98787	[2.56531]**
Inflation	-0.00149	[-1.28715]	-0.00143	[-1.04213]
Int. Rate	0.001444	[0.41579]	-0.00817	[-1.40876]
Trade	0.000498	[0.93120]	0.00126	[1.07508]
FDI	-0.00381	[-0.96405]	0.00404	[0.98500]
Money	0.000614	[1.33760]	0.00112	[1.36949]
ECT(t-1)	-0.00071	[-0.89812]	-0.02333	[-0.20029]
Rsquare	0.326616		0.58813	
Adj. Rsquare	-0.01008		0.38219	
F-stat	0.970073*		2.855837***	

T-statistics in parentheses [ ]; Variables significant at ***1%, **5% and *10% significant levels

TABLE VIII
LONG AND SHORT-RUN DYNAMICS FOR THE GHANA AND NIGERIA

	Ghana		Nigeria	
Long-Run	Dependent variable Real GDP			
T/ Credit	-0.00941	[-4.78631]***	-0.00061	[-0.25327]
Labour	-1.33466	[-13.5006]***	3.997746	[2.42295]**
Inflation	-0.00102	[-3.28212]***	-0.01285	[-9.44711]***
Int. Rate	0.002772	[2.94428]***	0.029243	[6.14978]***
Trade	0.006756	[6.74698]***	0.007555	[3.54630]***
FDI	0.006572	[1.47723]	0.046222	[3.78675]***
Money	0.003261	[7.32493]***	-0.00018	[-0.14820]
Short Run				
T/ Credit	-0.00302	[-2.98129]***	-0.00514	[-2.47366]**
Labour	0.413044	[1.24281]	-3.33479	[-2.43246]**
Inflation	6.64E-05	[0.60450]	0.000213	[0.23480]
Int. Rate	-0.0008	[-0.98362]	0.00117	[0.32760]
Trade	0.001454	[3.24981]***	-0.00035	[-0.29686]
FDI	-0.00975	[-3.58897]***	0.014275	[2.44777]**
Money	0.000605	[2.62372]***	0.002616	[2.16597]**
ECT(t-1)	-0.28	[-6.92711]***	-0.00183	[-3.01703]***
Rsquare	0.847792		0.56529	
Adj. Rsquare	0.782561		0.347935	
F-stat	12.9966***		2.600769***	

T-statistics in parentheses []; Variables significant at ***1%, **5% and *10% significant levels.

TABLE IX
LONG AND SHORT-RUN DYNAMICS FOR SIERRA LEONE

	Sierra Leone	
Long-Run	Dependent variable Real GDP	
T/ Credit	0.019208	[5.02392]***
Labour	2.217699	[2.83622]***
Inflation		
Int. Rate	0.065813	[9.33060]***
Trade	-0.06053	[-11.5310]***
FDI	0.059338	[8.38936]***
Money	-0.03332	[-6.02338]***
Short-Run		
T/ Credit	-0.00037	[-0.33057]
Labour	0.993224	[0.98481]
Inflation		
Int. Rate	-0.00015	[-0.04656]
Trade	-0.00077	[-0.34183]
FDI	0.001105	[0.57633]
Money	0.000383	[0.39256]
ECT(t-1)	-0.03419	[-0.69604]
Rsquare	0.269591	
Adj. Rsquare	-0.04344	
F-stat	0.861224*	

T-statistics in parentheses [ ]; Variables significant at ***1%, **5% and *10% significant levels.

The short run effects are also presented. The labour effect on economic growth in Gambia in the short run is positive. Other variables are either negative or have no impact on growth although significant. The coefficient of the lagged error is negative, meaning that the deviation from the short run to the long run is corrected by 0.0007%. However, this is not statistically significant. A percentage increase in labour in the short run in Gabon will lead to an increase in GDP by 2.98 percent. Other independent variables have no impact on

economic growth. The deviation from the short run to the long run is corrected by 0.023%. For Ghana, all the explanatory variables have little or no impact on economic growth. The coefficient of the lagged error shows that the deviation from the short run to the long run is corrected by 28%. In Nigeria, labour has a negative impact on economic growth in the short run, with remaining variables have no impact on economic growth. The lagged error indicates that the deviation from the short run to the long run is corrected by 0.001%. Finally, for Sierra Leone in the short run, we find no meaningful impact of financial deepening economic growth.

The results from the VECM are counter intuitive to basic growth model for some countries. Labour for example has negative impact on GDP in Gambia and Ghana while labour has no impact on GDP in Gabon in the long run. The result seems strange because economically, labour should have positive impact on GDP. These could be attributed to the structural features underlining some of these variables. An example is the quality of labour as determined through the quality of education in Africa. According to a study [19] on the impact of education on labour and economic growth in Sub-Sahara Africa, results show that education plays an important role in the development of productive labour force. Also, the lack of good schools in the Sub-Sahara African affects economic growth negatively. As an example, labour in Nigeria has a negative impact on growth in the short run. This could be associated with the influx of unproductive workers in the public sectors of the economy. Also the lack of human capital formation in Nigeria can be attributed to the negative effect of labour on economic growth. This is also consistence with the result by [31]; however, this should be investigated more as is beyond the scope of the research. FDI has a negative effect on economic growth in the short run of Gambia and Ghana. This result is not surprising because it is in consistence with the result of [4].

Financial deepening has negative or not much meaningful impact economic growth in the five countries under study. The estimates of Total credit suggest that to say categorically that financial development has a negative or not much impact on growth both in the short run and long run. These results are consistence with earlier studies by [8], [31], [4]. Total credit is a private capital flow and having a negative effect on economic growth is surprising. However, this result can be attributed to the volatility of capital flows in five countries on WAMZ. The financial market can transform the negative effect of the volatility of the capital flows into a positive one by allocation of foreign capital into productive investment. The negative effect of total credit to economic growth can also be caused by the absence of unorganised well-functioning domestic financial markets. The absence of a well-functioning financial market total credit will have a negative impact on economic growth.

C. Impulse Response

Figs. 2-6 show the response of the economic growth (RGDP) to shocks in total credit and other selected variable. Fig. 2 shows the response of GDP to the shock in total credit

and other variables for Gambia. The results show that positive shocks of labour and FDI to economic growth for Gambia are positive and significant overtime. However, the shock from total credit is positive but fades away overtime. The negative shock of total credit does not affect economic growth in the long run. For Gabon in Fig. 3, the most significant and persistence shocks is the shock from labour and FDI. The shock from FDI to economic growth is negative in the early quarters and then positive before going back to being negative. The shock from FDI is very significant because it is persistence over a long period of time. However, the shock from total credit is negative and insignificant and fades away after some time. For Ghana, the shocks to economic growth from all the variables are not persistence in the long run. Shocks from total credit to economic growth in Ghana are negative in the short run and positive in the long run but the effect dies after some long run time period. Results from Fig. 5 show that negative shocks from openness of trade to economic growth in Nigeria is persistence and significant. Positive shocks from FDI to economic growth are significant and persistent over the long time period. The shocks of total credit to economic growth are negative and insignificant because it is not persistence. The result from Fig. 10 shows that negative shock of FDI to economic growth is significant and persistent over time. However, negative shocks from total credit fades away over time.
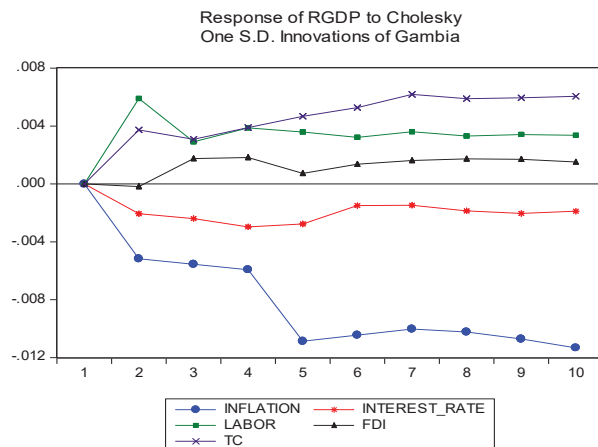

Fig. 6 Impulse response of GDP to other variables in Gambia

D. Forecast Error Variance Decomposition

In this section, we identify and compare the macro-economic shocks that West African Monetary zone countries face. We use country specific analysis, even though the economies face similar economic problems, the shock to their economies vary from one country to another. Forecast error variance decomposition allows us to draw logical conclusions about the movement of a particular time series data to its own shock arising from other variables in the estimated VECM. Here, we investigate a one-way causality hypothesis that, where shocks arising from financial deepening account for a larger share in economic growth, then, there is a causality running from financial deepening to economic growth.
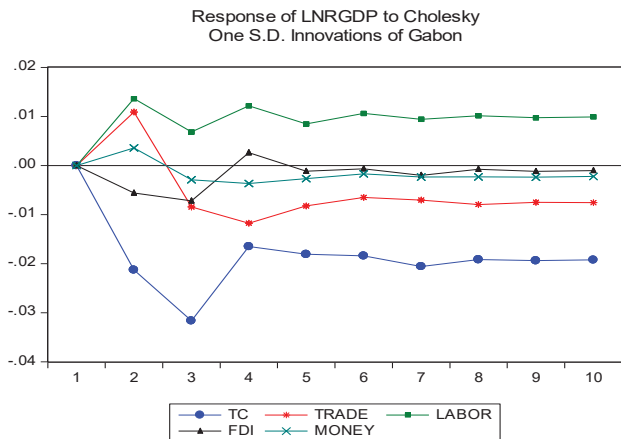
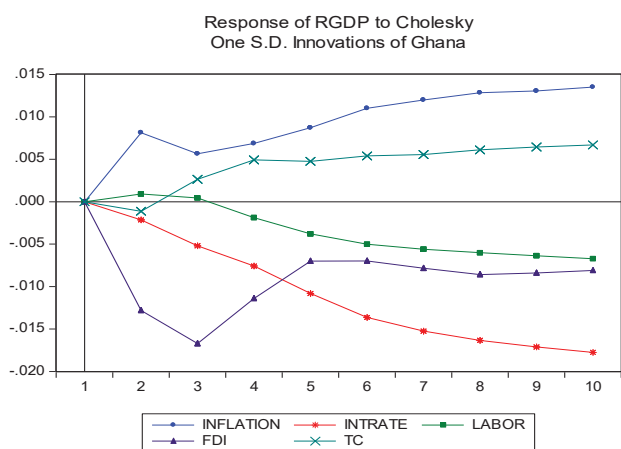Fig. 7 Impulse response of GDP to other variables in Gabon

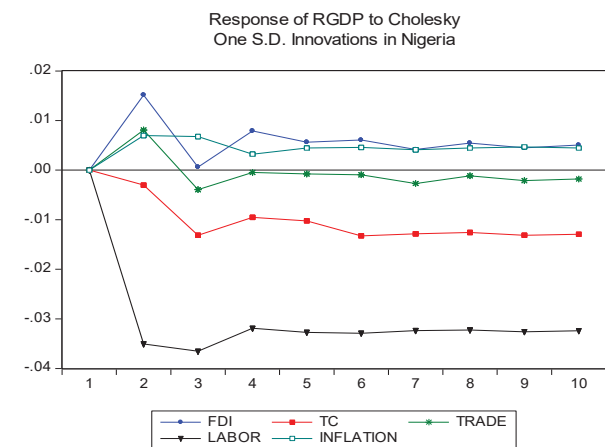Fig. 8 Impulse response of GDP to other variables in Ghana

Fig. 9 Impulse response of GDP to other variables in Nigeria

The results in Table X show the forecast error variance decomposition of ten time periods of the shocks to RGDP. The table shows that in the short run (3rd period), shocks to RGDP accounts for 90.04% variation of the fluctuation in RGDP (own shock). Shock to T.C can cause 0.72% fluctuation in RGDP. However, a shock in trade will result to 4.3%

fluctuation in RGDP. The table also shows that in the long run (10th period), shocks to GDP accounts for 84% variation of the fluctuation in GDP. A shock to total credit will result to just 1.7% of the fluctuation in GDP while shocks to openness to trade accounts to 5.65% fluctuation in GDP. Clearly, financial deepening does not impact much on economic growth in Gambia. Thus, we cannot identify causality from financial deepening to economic growth.
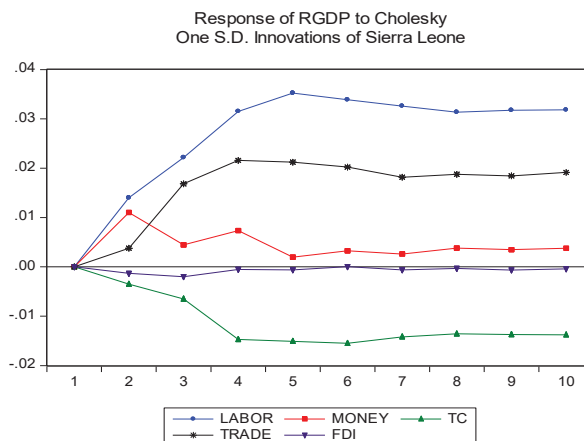

Fig. 10 Impulse response of GDP to other variables in Sierra Leone

TABLE X
VARIANCE DECOMPOSITION OF RGDP IN GAMBIA

P.D	S.E.	RGDP	MONEY	INF	TC	TRADE
1	0.032475	100	0	0	0	0
2	0.045362	91.98865	0.3772	1.303159	0.674132	3.754373
3	0.056817	90.04749	1.387642	1.788857	0.723462	4.306298
4	0.067252	89.40108	1.02615	2.052871	0.851038	4.822356
5	0.076486	87.44488	1.097034	3.605996	1.031691	5.032615
6	0.085726	86.6354	1.126495	4.356244	1.198892	5.06372
7	0.0943	85.6848	1.288244	4.7317	1.421693	5.335775
8	0.102179	85.0911	1.373375	5.032389	1.543385	5.483294
9	0.10958	84.60137	1.396248	5.332386	1.636441	5.594407
10	0.116588	84.14392	1.429192	5.654971	1.715552	5.658852

TABLE XI
VARIANCE DECOMPOSITION OF RGDP IN GABON

P.D	S.E.	RGDP	MONEY	INF	LABOR	TC
1	0.045243	100	0	0	0	0
2	0.079925	80.72725	0.343206	0.926875	12.95772	3.801864
3	0.10454	72.42791	1.741887	2.709974	13.43703	4.184411
4	0.123586	71.50539	2.30692	3.636008	14.61489	3.954538
5	0.13981	71.84872	2.712267	3.873321	14.20875	3.730248
6	0.153861	71.88359	2.397331	3.764715	14.76122	3.990965
7	0.165577	72.05787	2.331468	3.762431	14.80924	4.115875
8	0.176506	72.33208	2.331626	3.844492	14.8268	4.0769
9	0.187088	72.67837	2.298127	3.823202	14.73532	4.061563
10	0.197137	72.77204	2.208547	3.78951	14.84743	4.137423

Results in Table XI show that in the short run (3rd period) shock to GDP accounts for 72.4% variation of the fluctuation in GDP. A shock to total credit in the short run accounts for 4.1% in the fluctuation in GDP while shocks in labour causes about 13.4% fluctuation in GDP. In the long run using the 10th

period, a shock to GDP accounts to 72.7% of the variation in the fluctuation in GDP. A shock to labour causes about 14.8% fluctuation in GDP while a shock to total credit will only account for 4.13% fluctuation in GDP. This confirms the weak link or relation between economic growth and financial deepening in Gabon.

TABLE XII
VARIANCE DECOMPOSITION OF RGDP IN GHANA

PD	S.E.	RGDP	MONEY	INT	TRADE	TC
1	0.017392	100	0	0	0	0
2	0.034491	75.84937	1.799353	0.383042	2.424782	0.104812
3	0.049974	60.29768	8.131007	1.265745	8.239001	0.329746
4	0.063154	50.50326	13.10782	2.23411	15.20221	0.814419
5	0.074242	44.50669	16.76902	3.739416	18.32934	1.000993
6	0.084583	40.07887	19.38355	5.480444	19.09128	1.179602
7	0.094404	36.73948	21.37333	7.012539	19.05418	1.294541
8	0.103974	33.96994	22.96084	8.249955	18.89182	1.413209
9	0.113137	31.71769	24.26723	9.257244	18.78044	1.517848
10	0.121906	29.86256	25.31918	10.09587	18.68663	1.609139

Table XII shows the variance decomposition of RGDP on other variable in Ghana. From the result, in the short run (3rd period) a shock in GDP will account for the 60.2% variation of the fluctuation in GDP. Shock to FDI will cause about 17.7% of the fluctuation in GDP while a shock in total credit will account to just 0.3% variation of the fluctuation in GDP. However, in the long run, a shock to GDP will account to 29.8% of the variation in the fluctuation in GDP. Shocks to openness of trade, money supply and interest rate will account for 18.6%, 25.3% and 10% respectively. However, a shock to total credit will only account for 1.6% variation in the fluctuation in RGDP. Thus, we confirm also the weak link of causality between financial deepening and economic growth in the case of Ghana.

TABLE XIII
VARIANCE DECOMPOSITION OF RGDP IN NIGERIA

PD	S.E.	RGDP	LABOR	INF	TRADE	TC
1	0.05606	100	0	0	0	0
2	0.118728	88.0779	4.756109	0.609554	4.49535	0.063461
3	0.158368	86.4394	7.208948	1.388228	3.371652	0.050983
4	0.187217	86.63287	7.287092	1.275357	3.05696	0.05498
5	0.213144	86.64331	7.384566	1.253772	2.859761	0.04989
6	0.236309	86.60509	7.396265	1.308899	2.68913	0.05551
7	0.256966	86.61942	7.478134	1.323782	2.513672	0.060762
8	0.276076	86.62222	7.480882	1.345742	2.431325	0.062592
9	0.294005	86.60819	7.52948	1.375752	2.345501	0.064154
10	0.31082	86.60581	7.547886	1.390955	2.283504	0.06585

The results from Table XIII show that in the short run using the 3rd period, 86% of the forecast error variance of Nigerian RGDP was explained by the RGDP. Also in the short run, a shock to labour and trade accounts to 7.2% and 3.3% of the fluctuation in GDP. However, a shock to total credit accounts to just 0.05% to the fluctuation in GDP. In the long run (10th period), a shock to GDP accounts for 86.6% variation to the fluctuation in GDP. A shock to total credit accounts to only 0.06% of the fluctuation in RGDP. However, shocks to labour

and trade in the long run account to 7.54% and 2.28% respectively to the fluctuation in GDP. Again, we confirm the weak relation between financial deepening and economic growth for Nigeria.

TABLE XIV
VARIANCE DECOMPOSITION OF RGDP IN SIERRA LEONE

PD	S.E.	RGDP	MONEY	INT	LABOR	TC
1	0.072334	100	0	0	0	0
2	0.091624	95.64727	1.103369	0.54506	2.488193	0.025668
3	0.119551	91.3998	0.746527	1.058019	6.259693	0.029293
4	0.146634	85.25501	0.871288	2.35463	11.00485	0.042584
5	0.170481	81.22668	0.826188	2.90276	14.60829	0.042392
6	0.191046	79.29703	0.945368	3.172609	16.20048	0.047623
7	0.208012	78.38886	0.97863	3.241979	17.04558	0.055722
8	0.223293	78.01944	1.00433	3.254675	17.40885	0.054645
9	0.237458	77.74674	1.008205	3.270371	17.68879	0.052113
10	0.251117	77.4803	1.016696	3.295126	17.93942	0.0493

Finally, Table XIV shows the results of the forecast error variance decomposition of RGDP in Sierra Leone. A shock to GDP in the short run (3rd period) will account for 91.3% variation of the fluctuation in GDP, shock to total credit will cause 0.02% fluctuation in GDP. However, a shock to labour will cause 6.25% variation to the fluctuation in GDP. In the long run, a shock to GDP will account to 77.4% variation to the fluctuation in GDP. Shock in labour will cause 17.9% fluctuation in GDP while a shock to total credit will cause only 0.04% to the fluctuation in GDP, confirming the weak relation between economic growth and financial deepening.

The overall results of the variance decomposition and forecast error are consistence with findings made by [39]; [20]; [25]; [31]; [6]; [36]; [33]; [1]. The results suggest that financial development has little or no impact on economic growth in WAMZ with the exception of Gabon. In these countries results have shown that shocks to total credit will have minimal or no impact on economic contrary to findings made by [27]; [35]; [40]; [16]; [18]. The absence of one-way causality of financial deepening on economic growth in Nigeria, Ghana, Gambia and Sierra Leone can be caused by the inability of the financial sector to extend long and short term loans to the private sector. The broken-link of bank credit and real economy can be as a result of inability of assessing credit worthiness, scarcity of information and low level of bank deposit by the private sector. This is consistence with the findings of [21], [17].

V. CONCLUSION AND POLICY RECOMMENDATIONS

This paper used the innovation accounting techniques being the variance decomposition and impulse response function estimated from a VECM to examine the dynamics between financial development and economic growth in five countries of the WAMZ; Gambia, Gabon, Ghana, Nigeria and Sierra Leone. In the long run, there is positive impact of financial deepening on growth in Gabon and Sierra Leone. In the short run, the impacts are negative for all countries. However, the results from the impulse responses and variance decompositions show that, there is a weak link of evidence of

causality running from total credit which is a proxy of financial development to economic growth in the five countries of WAMZ investigated. Thus, there is weak or no sufficient evidence to support the hypothesis that financial development leads to economic growth in the WAMZ. Results from the impulse response gathered shows that a positive or a negative shock to total credit does not have a long term impact on economic growth.

The results from this paper are not surprising. Most evidence that have been found for finance led growth hypothesis such as [29] has been conducted for developed economies. Aggregate saving is high in these economies because they are high income earners. The financial sectors have enough credit to lend out as loans. This increases investment and production. However, in the West African countries, majority of its citizens live below the poverty line. Income in these countries equals to consumption, there is no room for extras to be channeled as savings. Secondly in these West Africa countries, the financial institutions find it difficult to give out long term loans. This is why the financial crises of 2008 did not affect Africa especially the WAMZ countries. Borrowers are under immense pressure to repay their loans. The lending process takes time with a lot of scrutiny to ascertain the creditworthiness of the borrowers. This is consistence with the findings of [21].

As a way of recommendation, the government of the WAMZ economies should concentrate on the following in order to boost economic growth:

a. Financial institutions should be encouraged to give out long term loans and reduce the pressure on borrowers to repay their debt.

b. The government and the financial institutions should prioritize the allocation of credit to economically productive activities and to private entrepreneurs who wish to invest in them. This will increase employment and boost economic growth.

c. The Micro-Finance banks in WAMZ should be encouraged to reduce their interest rates to borrowers. They should also be equipped to give credible investment advice to investors.

d. Governments of WAMZ should also be encouraged to reduce the political and economic unrest, inconsistency in economic policies as this tend to scare off potential foreign investors. Moreover, foreign direct invest according to the study has a direct effect on economic growth especially in Ghana, Gambia and Gabon.

e. Government of these WAMZ countries should be encouraged to employ highly productive labour force and avoid the influx of unproductive employees in their labour force. An unproductive labour force will have a negative impact on economic growth.

f. Finally, illiteracy and risk adverse nature of the citizens of the WAMZ discourages them from assessing loans for investment. This is because of their inability to pay back the loans and the high collateral involved. Financial institutions should be able to educate these risk adverse

potential investors on business best practices so that they will be able to borrow freely and pay back loans.

The arguments about the importance of financial development to economic growth have neglected the adverse effect of poverty in the regions of their research. Future research should target such areas. Also the results of this research also suggests that financial development is not a good measure for economic growth in the WAMZ countries until there is a well-functioning domestic financial market, easiness of assessing credit by the private sector and adequate human capital formation.

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