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Financial development and economic growth in West African Economic and Monetary Union (WAEMU)

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This study examines empirically the relationship between financial development and economic growth in the West African Economic and Monetary Union (WAEMU) for the period 1981-2010. Using the General Moment Method (GMM), the study found a positively and statistically significant effect of financial development on economic growth and the causality was bidirectional. In addition, the variable primary completion rate, foreign direct investment and real exchange rate contribute positively to economic growth in the region while inflation and openness discourage the economic growth in the region. In order to maintain a sustainable economic growth in those countries under study, the reforms for financial system improvement and education sector should be implemented. The policy makers should pursue target macroeconomic policies that may attract foreign direct investment while controlling for inflation and trade openness.

Key words: Financial development, economic growth, WAEMU, devaluation, franc-CFA.

INTRODUCTION

In the recent past, there has been a growing body of literature which attempts to highlight the relationship between financial development and economic growth. Some literature argue that, the link between financial development and economic growth is supply-leading which means economic growth just follow finance development through the supply of financial service that come from growth of financial institutions and markets (King and Levine, 1993b; Xiaoqiang et al., 2010). However some people have a different opinion by arguing that the relationship is demand-driven which means the growth of modern financial institutions is a result of the demand of financial services that come from investors and savers (Robinson, 1952; Nicholas, 2010).

According to Patrick (1966) and Song et al. (2010), the link between financial development and economic growth is both supply-leading and demand-driven. In addition, some other authors argue that there is no link between financial development and economic growth (Lucas, 1988; Mohamed, 2008). However, this argument may not be correct since when we experience financial crisis, countries economic growth tend to slow down. This was evident in the recent USA financial crisis which was contagious to other countries through globalization and economic integration. Most countries economic growth slowed down and the effects of financial crisis are still experienced in other countries such as Greece, Italy, Spain, Portugal, Ireland etc.

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While there is a large amount of work that investigated the finance-growth relationship; there is no consensus on the impact of financial development on economic growth and few papers have also taken a regional approach. Furthermore, the recent financial crisis has shown that the impact of the financial development on economic growth depends on the level of economic development of a particular country because they have different level of economic development and they cannot use the same macroeconomic policy to fight against the financial crisis. Hence, it is crucial that each region understands how its financial system relates to its economic growth in view to find the right macroeconomic policy that can assist during the financial crisis. Besides, WAEMU region is dominated by banks and still characterized by underdeveloped financial markets that constrains resource mobilization and hinder economic growth. As countries in WAEMU region share similar historical, political, and socio-economic backgrounds; it is important to investigate the finance-growth relationship in this region since we may not generalize the relation according to the divergence of previous empirical work.

It is for these reasons that this study is set out to investigate the impact of financial development on economic growth for eight West African countries which include: Benin, Burkina Faso, Cote d'Ivoire, Guinea Bissau, Mali, Niger, Senegal and Togo, in West African Economic and Monetary Union (WAEMU) while taking into account the endogeneity problem. In addition, the study investigates the effect of the franc CFA currency devaluation on the economic growth in the region.

As regards the existing literature, this study uses new data and modern econometric procedures that address for potential biases induced by simultaneity, omitted relevant variables, unobserved country-specific effects, non stationary in data and cointegration issue that have been persistently featured in the previous study on the finance-growth nexus. The use of new data is with at most important due to globalization and economic integration that becomes the main feature of the real world economic. Moreover, the study used one variable as a proxy for financial development; namely domestic credit to private sector as a percentage of GDP while most of the existing empirical works on finance-growth links have used more than one. We justify our choice of domestic credit to private sector as follow. First, credit measures the extent to which financial market and institutions provided credit to domestic investors that enable them to undertake and expand their investment (John Hicks, 1969). Second, these countries are under fixed exchange rate which means they have given up a powerful tool for changing the level of economic activity through increased money supply (given up control of their interest rate). The third reason is the neutrality of money in the long run since the long run growth is due to technical progress, capital accumulation and skill labor. The latest is that their central bank does not have free

policy setting as western central bank because of colonization issue.

Considering WAEMU region, few studies have addressed the link between financial development and economic growth both in macro and micro level. Even those studies have not investigated the endogenous issue of financial development. They have also paid less attention on the effect of franc CFA currency devaluation which favours the exportation sector (tradeable goods), consequently growth of domestic production that lead to economic growth.

Following the introduction, the rest of the paper is organized as follow. Section II reviews the existing literature. Section III presents the methodology that enables us to investigate the impact of financial development on economic growth in the region. Section IV describes data set, presents the estimation technique and explains the results. Section V concludes the study and provides some policies recommendations.

LITERATURE REVIEW

There are several studies which support positive relationship between financial deepening and economic growth, among them include Nabila and Zakir (2014) who empirically examine the channels through which financial development may influence economic growth in developing countries over the period of 1978-2012, more specifically in the context of Foreign Direct Investment (FDI) and trade openness. The results revealed that there are strong evidences of the long-run relationship between financial development and economic growth in developing countries. In addition, there is bi-directional causation between financial development and FDI. Moreover, trade openness has impact on financial development in all the countries, which calls for the introduction of effective policy measures to promote trade between countries.

To study the effect of financial development on economic growth in Lithuania, Laima and Oleksandra (2014) used VAR models framework and a sample of six variables: GDP per capita, liquid liabilities, private credit, market capitalization, turnover ratio and value traded ratio covering the period 2000Q1-2013Q2. Results showed that the relationship between financial development and economic growth in Lithuania obeys the supply leading hypothesis meaning that there is the significant impact of Lithuanian financial development on country's economic growth.

Antonios (2013) examined the relationship between financial development and economic growth for Ireland over the period 1965-2011. He used a vector error correction model based on Johansen cointegration analysis and stationarity tests. Finally, Granger causality method is applied in order to define the direction of causality between the examined variables. The empirical

results indicated that there is a bilateral causal relationship between economic growth and industrial production, while there is a unidirectional causality between economic growth and credit market development. Furthermore, stock market development causes economic growth and industrial production.

Bojanic (2012) investigated the impact of financial development and trade on the economic growth of Bolivia during the 1940-2010 period. The empirical results indicated that there is indeed a long-run equilibrium relationship, and that unidirectional Granger causality runs from the indicators of financial development and trade openness to economic growth.

Ernesto and Marcelo (2013) employed time series techniques that deal with the problem of cross-sectional dependence and relax the constraint that the slope parameters of the independent variables should be the same for all countries, to demonstrate that financial development does not have a significant influence upon economic growth.

Adil and Mohammad (2014) examined causalities among foreign direct investment (FDI), economic growth (GTH), and financial development proxied by both equity market size (EQM) and bank credit to private sectors (BANK). They used a structural cointegration model with a vector error correction (VEC) mechanism to test for the short-term dynamics of the model. The results revealed that developed financial markets are an essential precondition for the positive impact of FDI on economic growth, reflecting host countries' ability to exploit FDI more efficiently. In addition, the paper provides further substance for the notion that a country with a well-developed financial market gains significantly from FDI inflow.

Michael and Nkrumah (2013) employed cointegration, Fully-Modified Ordinary Least Squares (FMOLS), Error Correction and the Generalized Method of Moments (GMM) techniques to investigate the relationship between economic growth and financial development using annual time series data (1971-2010) from Ghana. Three measures of financial development are used: domestic credit as a share of GDP; domestic credit to private sector as a share of GDP and broad money supply as a share of GDP. The finding of the study suggested that financial development undermines economic growth in Ghana.

Xianming and Jiang (2014) investigated the promoting effects of financial development on economic growth in China. They addressed the effects of developments in the banking, securities, and insurance sectors on the outputs of China's primary, secondary, and tertiary industries. Empirical results showed that the banking and insurance sectors provide significant promoting effects on economic growth; the promoting effect of the securities sector is uncertain.

Levine et al. (2000) in their paper "Financial intermediation and growth", have investigated two aspects. The

first one is whether the exogenous component of financial intermediary development influences economic growth. The second one is whether cross-country differences in legal and accounting systems explains differences in the level of financial development. They used three indicators of financial intermediary development namely private credit, commercial-central bank and liquid liabilities. The findings of the study revealed a positive relationship between the exogenous components of financial intermediary development and economic growth.

Levine (1991) in his paper "Stock Markets, Growth, and Tax Policy", investigated the role of stock market in economic development. He used endogenous growth model in which a stock market emerges in allocation of risk and alters investor in ways that shift steady state growth rate. He argued that stock market accelerate growth by two ways. One is, it facilitates the trade of firms' ownership without disturbing the productive processes. Second, is to allow agents to diversify portfolios.

Zang and Kim (2007) in their paper "Does financial development precede growth, Robison and Lucas might be right" used panel approach in their investigation. They used data of seventy four countries over the period 1961-1995. They used three financial indicators as measure of financial development, namely ratio of liquid liabilities to GDP, ratio of deposit money bank domestic assets to deposit money banks domestic assets plus central bank domestic assets and credit issued to private enterprises as a share of GDP. Their findings confirm that economic growth precedes subsequent financial development.

Esso (2009) examined the causal relationship between financial development and economic growth in ECOWAS countries, using data from 1960 to 2005. He adopted the autoregressive distributed lag analysis and the test for non causality proposed by Toda and Yamamoto (1995) were used. The ratio of M2 to GDP was used as measure of financial development and the author found long-term relationship between financial depth and economic growth in some countries namely, Cote d'Ivoire, Guinea, Niger and Togo. But a negative long-run relationship was found in Sierra Leone and Cape Verde.

Djeto et al. (2010) examined whether legal origin and CFA membership matter for financial development and growth in Sub-Saharan Africa. The study supports the British legal advantage with respect to financial development and indicates to positive contribution of financial development to economic growth in British origin Sub-Saharan Africa. While a negative impact of financial development on economic growth was found for French legal origin Sub-Sahara Africa. Furthermore, the study indicate that the currency union constraints tend to hinder the financial depth in CFA countries where its negative impact on economic growth came from.

Anson and Xianbo (2011) in their paper "Development of Financial market and Economic Growth" investigated the link between financial market and economic growth.

They have used panel data analysis for Hong Kong, China, Japan, The United States and The United Kingdom over the period 1988 to 2008. The stock market capitalization is used as a measure of financial market development. The results showed that the stock market development has an independent strong positive correlation with the economic growth of those countries investigated.

Hurlin and Venet (2008) investigated the finance-growth relationship. They used a sample of 63 industrial and developing countries over the period 1960 to 1995 and 1960 to 2000. They have used three indicators as measure for financial development namely, private credit by deposit money banks to GDP; liquid liabilities of the financial system to GDP and the credit by money banks and other financial institutions to the private sector. Their findings support the one way causality from economic growth to financial development.

Nicholas (2010) has investigated the links among finance, investment and growth in South Africa by using auto regressive distributed lags framework. The author used annual data from 1969 to 2006 and three measures of financial development was used, namely M2/GDP, the ratio of private credit to GDP and the ratio of liquid liabilities to GDP. The study shows that economic growth has a strong influence on financial development. Furthermore the study indicates a unidirectional causality that runs from economic growth to investment and it later granger cause financial development.

Patrick (1966) in his study of finance-growth relationship in underdeveloped countries; identified bi-directional causality between financial development and economic growth, namely the supply-leading and demand-following. The author argued that the supply-leading view dominate during the earlier stage of growth. This means the growth of financial institutions and markets would channel scare resources from savers to investors according to a higher rate of return on investment. The author further maintained that the supply-leading view will disappear gradually as the process of real growth occurs and will turn to demand-following. For him, as the economic grow, the demand for new financial service would be met passively from the financial side.

Omid and Zahra (2009) studied the links between financial development and economic growth in MENA region. The authors used general moment method (GMM) and annual data from 1975 to 2004. Five indicators were used as measures of financial development, namely the ratio to GDP of liquid liabilities (M3), liquid liabilities less narrow money divided by GDP, credit allocated to the private sector to GDP, bank credit (credit by deposit money bank to the private sector to GDP) and the composite index of financial development. Their results show a strong two way causality between financial development and economic growth.

Houssein and Hassene (2011) in a paper "The Causality between Financial Development and Economic

Growth" examined finance-growth links as well as the causality. They have used Fully modified OLS approach, GMM analysis and data of 10 countries over 1990-2006, six countries from OECD and four others from MENA. A long-run relationship between financial development and economic growth was confirmed for the 10 countries investigated by a panel data cointegration analysis. The GMM system approach showed a strong positive link between financial development and GDP per capita. The bi-direction causality between financial development and economic growth was found for OECD countries when error correction model approach was used, while a unidirectional causality was found for MENA countries that run from economic growth to financial development.

Lucas (1988) in his paper "On the mechanics of economic development" rejects the existence of any relationship between finance and growth. He argues that economists badly over-stress the role of financial factors in the process of economic growth. Financial market development may well turn out to be an obstacle to economic growth if it reduces volatility and discourages risk-averse investor from investing (Singh, 1997). Furthermore the introduction of some kind of financial tools that assist individual to protect against risks may reduce saving and hence lowers economic growth (see Mauro, 1995).

Rousseau and Wachtel (2000) showed that the finance-growth relationship is not strong in more recent data as it was in the original studies with data for the period over 1960-1989. They argue by saying; firstly, excessive financial development or too rapid growth of credit may lead to both inflation and weakened banking systems which in turn inhibit growth through financial crisis (case of USA subprime from summer 2007). Secondly, excessive financial development may result from widespread financial liberalization from 1980 and 1990 in countries that lacked the legal or regulatory infrastructure to exploit the benefit successfully.

Keho (2010) in his paper "Effect of Financial Development on Economic Growth: Does Inflation Matter?" examined the effect for seven out of eight countries of UEMOA and he found no evidence of nonlinear relationship between finance and growth. He used threshold models, cross-terms regression and argued that financial development has no significant impact on economic growth regardless of the level of inflation.

In light of the literature reviewed above, it is evident that the existing literature report mixed results, some report positive, negative while others report no relationship between financial development and economic growth. This implies therefore there is still need to further investigate the relationship between financial development and economic growth specifically for regional level like WAEMU because it cannot be generalized that factors that explain financial development in Euro-countries are the same for Africa-countries as the country

stability, country laws that protect saver and creditor will significantly affect the financial development.

METHODOLOGY

Here we present the method that enabled us to investigate the nature of relationship between financial development and economic growth in the West African Economic & Monetary Union.

Model specification

The theoretical literature and the empirical study discussed in previous section predict and prove the bidirectional positive relationship between financial development and economic growth. If it is admitted that financial development boost economic growth, then economic growth may reciprocally boost financial development. Consequently; we set out the following two models to investigate the link between financial development and economic growth. The first one is the dynamic growth model used by Levine et al. (2000) in their paper "Financial intermediation and growth: causality and causes". The second one is the model used by Dimitris et al. (2003) in their paper "Financial development and economic growth: evidence from panel unit root and cointegration tests".

$$Ly_{it} - Ly_{it-1} = (\alpha - 1)Ly_{it-1} + B_0 + B_1 Fd_{it} + B_2 Inf_{it} + B_3 Pm_{it} + B_4 Op_{it} + B_5 LFDI_{it} + B_6 Rexch_{it} + e_{it} \quad (1)$$

$$Fd_{it} = \alpha Fd_{it-1} + B_0 + B_1 Ly_{it} + B_2 Inf_{it} + B_3 Pm_{it} + B_4 Op_{it} + B_5 LFDI_{it} + B_6 Rexch_{it} + e_{it} \quad (2)$$

Where:

Ly_{it} = natural logarithm of real GDP per capita,

Fd_{it} = measure of financial development proxy by variable credit facilities available to domestic sector,

Inf_{it} = inflation, consumer prices (as an annual percentage),

Op_{it} = openness measured as exports plus imports as a percentage of GDP,

Pm_{it} = primary completion rate used as measure of human capital development,

$Rexch_{it}$ = real exchange rate between USA dollars and franc CFA, variable introduced to capture the effect of the franc CFA devaluation,

$LFDI_{it}$ = natural logarithm of foreign direct investment,

e_{it} = error term.

Theoretical assumption

In order to achieve the objective of the study, we expect variable financial development to be endogenous; hence the coefficient of financial development should be significant in the first equation; as well as the coefficient of real GDP per capita in the second equation to ascertain the bidirectional causality.

Variable financial development, primary completion rate,

devaluation and foreign direct investment are expected to have a positive effect on economic growth while inflation and openness are expected to deter economic growth in our study.

Financial development is proxied by credit facilities available to domestic sector as a percentage of GDP. Adequate credit facilities enable investors to expand their investment projects. Hence credit facilities are expected to have a positive effect on economic growth through an increase of production in view to meet a higher demand. It helps manager to hire more factors of production such as labour, capital and raw materials.

Inflation refers to a sustained rise in the general level of price and it can affect economic growth negatively. This is when prices increase persistently, the cost of production will be expensive to the investors, hence can force them to reduce their investment plan. This implies they reduce production and employment and thus will have a negative effect on economic growth. Rising inflation is always associated with higher policy interest rate which reduces private investment, leading to slow economic growth.

Primary completion rate refers to the percentage of students completing the last year of primary school. This variable is used as a proxy for human capital development. Human capital is one of the most important factors of production. A higher literacy rate improves the efficiency of an economy as it provides a more productive labour force. We expect primary completion rate to have a positive effect on economic growth.

A greater degree of openness may benefit both developed and some developing countries but not for all developing countries like those under this study. These countries are exporter of raw materials, agriculture and intermediate goods and are importer of final goods. This kind of trade will negatively affect the economic growth of those countries, because it benefits only for foreign companies which are supplier of final goods to grow in size by increasing their production. So we expect openness to have a negative effect on growth in our study. Those countries may benefit from openness if only their open economy increase competitions which improve the quality and stabilize price of goods and services and promotes the domestic export but this is not the case in those countries under study.

Devaluation refers to an official depreciation of home country currency against foreign currency. It was proxied by real exchange rate between USA dollars and franc CFA in view to capture its effect on economic growth in the region. This must positively affect the WAEMU countries export and negatively affect WAEMU countries import. To respond to growing in export, WAEMU countries supposed to increase their domestic productions which lead to economic growth. We expect devaluation to have a positive effect on economic growth in our study.

Foreign direct investment refers to the net inflow of investment and is expected to have a positive effect on economic growth as the FDI is the way the technology was transferred to less developing countries and the aspect of employment generation.

DATA, ESTIMATION TECHNIQUE AND INTERPRETATION OF THE RESULTS DATA

The data for this study (Financial development and Economic growth in the West Africa in Economic and Monetary Union) have been collected from the World Development Indicators 2011 (World Bank), except of exchange rate between USA dollars and franc-CFA which has been collected from UNCTAD data base.

Real GDP per capita refers to the deflation of the current GDP per capita by the GDP deflator while real exchange rate is computed by multiplying the nominal exchange rate with USA Consumer Price index (CPI) and

then divided by domestic consumer price index. Credit to the private sector is computed as a percentage of gross domestic product (GDP) and it refers to financial resources provided to private sector such as through loans, purchases of nonequity securities, trade credits and other accounts receivable that establish a claim repayment.

Inflation then reflects the annual percentage change in the cost of basket of goods and services acquiring by consumer that may be fixed or changed at specified intervals (yearly). Primary completion rate is the percentage of students that completed the last year of primary school while Openness is computed as exports plus imports, divided by gross domestic product (GDP). It measures the degree of trade liberalization.

Foreign direct investment refers to the net inflow of investment to acquire a lasting management interest in an enterprise operating in an economy other than that of the investor. It covers equity capital, earnings re-investment, and other long-term and short-term capital.

Estimation technique

Since our model is growth model, to investigate the relationship between growth and financial development, an appropriate technique is to use a recently General Moment Method (GMM) which has been developed by Blundell and Bond (1998) to estimate dynamic panel data analysis. The General Moment Method technique controls for endogeneity of all explanatory variables, allows for the inclusion of lagged dependent variable as a regressor and account for unobserved country-specific effects. So we have checked for endogeneity of variable financial development by using Nakamura & Nakamura (1981) approach and the test is meaningful in 1% level (see appendix 1). We also consider variables inflation, primary completion rate, foreign direct investment and openness as predetermined variables (weakly exogenous) which state that these explanatory variables can be affected by the current and past realizations of the economic growth rate but must be uncorrelated with future realizations of the error term.

We then checked for autocorrelation in our data. The real GDP per capita and financial development are showing a long period autocorrelation (see appendix 1). Furthermore, since our study regroup small number of countries (only eighty countries); we have used GMM in system of Blundell and Bond (1998).

EMPIRICAL RESULT AND INTERPRETATION

The variables that are statistically significant in the GMM estimation include initial level of GDP, financial development, inflation and openness. Variables which are not significant are primary completion rate, foreign

direct investment and real exchange rate (Table 1). Although insignificant, those variables (primary completion rate, foreign direct investment and real exchange rate) obtain the correct sign in relation to economic growth in our study. A possible explanation of the insignificance of primary completion rate is due to the sample group which does not capture fully human capital development. Possibly if we had a data for high school or university could serve as a good proxy for human capital development.

Foreign direct investment has the expected positive sign although not significant. This could imply that the foreign direct investment flow is inadequate to stimulate economic growth in the region (WAEMU) due to infrastructure problem and political environment.

The variable real exchange rate, although insignificant contributes positively to economic growth in the region. This means those countries did not reap the full benefit of devaluation due to the uncompetitive products because of underdeveloped infrastructure. The variable financial development is positively and statistically significant at one percent (1%) level as expected. It means that financial development is one of the main factor which drives economic growth, this support the findings of some authors in the literature (Laima et al., 2014). The variables inflation and openness have negative sign as expected and statistically significant at one percent (1%). It means that inflation and openness deter economic growth in those countries under our study. Inflation deters economic growth through increase in the cost of production. The openness hurts economic growth through un-competitiveness of our product in domestic market because of infrastructures problem that face most of African countries which translates high production costs hence high prices. Therefore, the best way for those countries is to exercise some degree of openness to minimize external shocks.

A particular interest is the coefficient of initial GDP; it is negative and statistically significant at 1%. This confirms convergence among the countries under investigation. This means wealthier country tend to grow slower than poor country due to convergence effect in neoclassic theory. The empirical result of the impact of economic growth on financial development is presented in Table 2. We can see from that table that GDP per capita and inflation are positively and statistically significant at one percent (1%) level. The primary completion rate and real exchange rate are positive but not significant; while openness and foreign direct investment have negative impact on financial development. The variable GDP per capita is statistically significant at one percentage (1%) level. This finding supports the argument of those authors who argue that economic growth drives or leads to financial development. This confirms our hypothesis of bidirectional causality between financial development and economic growth. The idea of a positive impact of inflation on financial development (credit) can be explained in the

Table 1. Parameter Estimated for the Equation (1) by using GMM.

Variables	$Ly_{it} - Ly_{it-1}$
$L.Ly_{it}$	-0.14476*** (0.0324398)
Fd_{it}	0.00988*** (0.00341)
Inf_{it}	-0.00823*** (0.000769)
Pm_{it}	0.000164 (0.000527)
Op_{it}	-0.00221*** (0.000658)
$LFDI_{it}$	0.00334 (0.00828)
$Rexch_{it}$	4.49e-06 (3.60e-06)
Constant	0.383** (0.154)
Observations	186
Number of cn	8
Wald chi2(13)	3072.78
Prob > chi2	0.0000
Standard errors in parentheses	
*** p<0.01, ** p<0.05, * p<0.1	
Sargan test of overid. Restriction:	Chi2(306)=304.0157; Prob>chi2=0.5213
Arellano-Bond test for AR(1) first dif:	Z= -2.4138; prob=0.0158
Arellano-Bond test for AR(2) first dif:	Z= 0.50951; prob=0.6104

Note: Natural logarithm of real GDP per capita (Ly_{it}) is the dependent variable.

way that during high inflation, investors tend to increase their investment to maximize profit due to high prices. This will also attract firms to enter the market which leads to higher investment hence economic growth. The real exchange rate has a positive effect on financial development. This means the depreciation over the study period have favour export sector. Due to increased export, the export sector will borrow the money from financial institutions so as to increase production and hence higher credit. The openness and the foreign direct investment have a negative effect on financial development although not significant. The greater the degree of openness will attract foreign multinational companies hence this will create competition with the domestic investors. Given that multinational companies are more superior than domestic investors, may lead to crowding out of domestic investment. This will lead to low demand for credit facilities, therefore impeding financial development. The estimated coefficient of human capital development is positive as expected although not significant. The positive

sign indicates that those people who have a relative higher level of education can go for credit facilities from financial institutions and with the level of education can manage well their business compared to those with low level of education. Segher et al. (2009) confirm the positive effect of human capital development on financial development by arguing that entrepreneurs with business education had better knowledge of financial products.

CONCLUSION AND RECOMMENDATIONS

The study examined the relationship between financial development and economic growth in West African Economic & Monetary Union (WAEMU) for the period 1981-2010. Using the General Moment Method (GMM), the study found a positively and statistically significant effect of financial development on economic growth and the causality was bidirectional. The findings give a

Table 2. Parameter Estimated for Equation (2) by using GMM.

Variables	Fd_{it}
$L.Fd_{it}$	0.805*** (0.0296)
Ly_{it}	2.870*** (0.933)
Inf_{it}	0.0560*** (0.0146)
Pm_{it}	0.00260 (0.00876)
Op_{it}	-0.00802 (0.0111)
LFDI _{it}	-0.0266 (0.136)
Rexch _{it}	9.13e-06 (5.85e-05)
Constant	-9.760*** (2.541)
Observations	186
Number of cn	8
Wald chi2(13)	1601.89
Prob > chi2	0.0000
Standard errors in parentheses	
*** p<0.01, ** p<0.05, * p<0.1	
Sargan test of overid. Restriction: Chi2(306)= 298.8151; Prob>chi2=0.6048	
Arellano-Bond test for AR(1) first dif: Z= -1.7007; prob=0.0890	
Arellano-Bond test for AR(2) first dif: Z= 0.95174; prob=0.3412	

Note: Financial development (Fd_{it}) is the dependent variable.

Table 3. Autocorrelation test: White noise test.

Country	Variable			
	Log per capita GDP		Credit	
	statistic	p-value	statistic	p-value
Benin	51.1251	0.0000	131.7330	0.0000
Burkina Faso	47.8397	0.0000	86.3213	0.0000
Cote d'Ivoire	22.1722	0.0527	118.6952	0.0000
Guinea Bissau	58.4947	0.0000	53.5256	0.0000
Mali	47.4067	0.0000	74.8663	0.0000
Niger	66.9219	0.0000	128.4102	0.0000
Senegal	47.9793	0.0000	88.1626	0.0000
Togo	26.7919	0.0133	75.2385	0.0000

support to the view of Antonios (2013).

Furthermore, the variable primary completion rate, foreign direct investment and devaluation of franc-CFA proxy by real exchange rate between USA dollars and

franc-CFA, contributed positively to economic growth in the region while inflation and openness discourage economic growth in the region. The positive impact of education on economic growth has been support by

some author among them; we have Berthelemy et al. (1996) who argued that human capital development is pre-condition for economic growth. The negative impact of inflation and openness on economic growth has been found by Rousseau and Wachtel (2000).

In order to foster the economic growth in WAEMU countries, it is therefore imperative that policies which may deliberately increase financial depth be vigorously pursued. Target macroeconomic policies that control for inflation, openness and corruption are necessary. Policy makers should implement policies that may attract foreign direct investment through regional stability, infrastructural improvement and creditors' right reinforcement. It is also important to introduce reforms in education sector which may lead to quantitative and qualitative human resources.

In summary, these findings highlight the relationship between financial development and economic growth in WAEMU in panel view. Since the coefficients estimate are only average effects for the sample of countries investigated and do not represent any specific country in the sample; it is difficult to draw country specific policy conclusions based on the panel results. Therefore a possible extension of this study would be an investigation of time series issue for each country in the Union and how much bank and non-bank financial institutions contribute to economic growth in WAEMU's countries.

Conflict of Interests

The authors have not declared any conflict of interests.

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