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**Volume 33, Issue 3****Financial development and economic growth: the case of ECOWAS and  
WAEMU**

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**Abstract**

This paper examines the interaction between financial development and economic growth of the Economic Community Of West African States (ECOWAS) and West African Economic and Monetary Union (WAEMU) using non-stationary panel data methodology and a panel cointegration approach. We estimate a trivariate vector error correction model (VECM) to simultaneously assess the long- and short-term impact of financial development on economic growth. The results suggest that the use of the common currency promotes financial stability and allow the same preference of demand domestic credit to private sector and liquid liabilities in foreign currencies both contribute to economic growth in the WAEMU. However in ECOWAS zone, in long-term (as in short-time), they prefer detente domestic credit (private and bank sector) which contribute to economic growth to liquid liabilities in foreign currencies which is negatively correlate to economic growth.

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## 1. Introduction

The relationship between financial development and economic growth has been recognized in both the theoretical and the empirical economic literature. Gurley and Shaw (1955), Goldsmith (1969) and Hicks (1969) works, have emphasized into financial development stimulates economic growth. An efficient financial system enables economic growth while directing. The main contribution of the financial system to economic growth based on the fact that it ensures the operation of a payment system efficient and scalable, which mobilizes savings and improve the allocation of investment through rate positive real interest (Lartey Emmanuel, 2010).

McKinnon (1973) argued that financial deepening not only improves the productivity of capital, but also the savings rate and, consequently, investment and growth. Braun and Raddatz (2007), Jung (1986), Levine (1997), King and Levine (1993), Compton and Giedeman (2011) showed that the level of financial intermediation is a good estimator of economic growth and financial development is an important determinant of economic growth. Demetriades and Hussein (1990) chose as a measure of financial development ratio: currency relative to GDP and found that the causality works in both directions especially for developing countries. Berthelemy and Varoudakis (1996) show a negative relationship between financial development and growth in financially repressed economies, this relationship is not significant following the financial reforms. They argue that this result is justified by the existence of threshold effects associated with multiple equilibrium in the long-run relationship between financial development and growth.

The contributions and objectives of our article are as follows. This article supplements the literature by analysing the relationship between financial development and economic growth, using nonstationary panel data methodology for two different African regions. Heterogeneous panel cointegration tests and a panel trivariate Vector Error Correction Model (VECM) is used to understand the relationships between financial development (through two series: Domestic credit provided by banking sector and Liquid liabilities) and the economic growth in the Economic Community Of West African States (ECOWAS) and Economic and Monetary Union of West Africa (WAEMU). We improve the power of the traditional cointegration test by combining information from time series and cross section data in a heterogeneous panel cointegration framework, and we distinguish between short-run and long-run relationships. This study is conduct in relatively little-studied regions: ECOWAS and WAEMU with common currency.

This article is organized as follows: the first section is devoted to the introduction, the second section presents the analysis methodology and the empirical results and the third section presents a summary and conclusions.

## 2. Panel data cointegration procedure, results and discussion

Like the methodology of Damette and Fromentin (2013), we use a new methodology, that is heterogeneous panel cointegration tests and estimate a panel trivariate Vector Error Correction Model (VECM) to simultaneously assess the relationship and the causality between financial development and economic growth in both the short and long-term.

### 2.1 A panel data framework

To investigate the relationship between financial development and economic growth, we use a panel data set. The economic growth is represented by the Gross Domestic Product

per capita (*GDP*) (USD, constant prices and PPPs). Financial development is usually measured by the quantitative and qualitative improvement in the services, provided by the financial sector. We employ commonly used variables to evaluate financial development. The Domestic Credit to Private Sector to GDP (*DCPS*) refers to financial resources provided to the private sector, such as through loans, purchases of non equity securities, and trade credits and other accounts receivable, that establish a claim for repayment. The liquid liability to GDP or broad money (*M3*) measures the overall level of the financial intermediation development. In addition, we retain two short-run exogenous variables: domestic credit to GDP (*DCPBS*) includes all credit to various sectors on a gross basis, with the exception of credit to the central government and Bank Liquid Reserves to bank assets (*BLRBAR*) (ratio of domestic currency holdings and deposits with the monetary authorities to claims on other governments, non financial public enterprises, the private sector, and other banking institutions). The data are from the World Bank's World development indicators (2010).

The ECOWAS<sup>1</sup> member countries are divided in two groups: a first group of eight countries sharing a common currency Economic and Monetary Union of West Africa (WAEMU)<sup>2</sup>, and a second group of seven non-WAEMU countries with no common currency. The database consists of two panels: ECOWAS and WAEMU with common currency. We also want to identify any effect of monetary union on economic development. So, our econometric analysis focuses on ECOWAS (the "panel 1" consists of a set of 15 countries over the period 1960-2006 with 705 observations) and WAEMU with common currency (the "panel 2" consists of a set of 8 countries over the same period with 376 observations).

## 2.2 Results of the Unit Roots Tests

Before estimating a potential long-run relationship between *GDP*, *DCPS* and *M3*, we first apply the unit root tests in order to find the stationary or non-stationary of the three variables. We conduct three panel unit root tests: Levin, Lin and Chu (2002) (LLC), PP-Fisher and ADF-Fisher. The null hypothesis for all tests is that the series contains a unit root.

**Table 1. Panel unit root tests results**

|                |             | LLC    |                             | ADF-Fisher |                      | PP-Fisher |                      |
|----------------|-------------|--------|-----------------------------|------------|----------------------|-----------|----------------------|
|                |             | Levels | 1 <sup>st</sup> differences | Lev.       | 1 <sup>st</sup> dif. | Lev.      | 1 <sup>st</sup> dif. |
| <i>Panel 1</i> | <i>GDP</i>  | 3,929  | -19,73***                   | 6,499      | 430,22***            | 6,094     | 430,127***           |
|                | <i>DCPS</i> | -0,396 | -21,74***                   | 20,662     | 506,67***            | 21,032    | 606,88***            |
|                | <i>M3</i>   | 2,151  | -27,34***                   | 16,166     | 1133,99***           | 14,774    | 1134,79***           |
| <i>Panel 2</i> | <i>GDP</i>  | 2,836  | -15,59***                   | 2,718      | 263,09***            | 2,405     | 261,378***           |
|                | <i>DCPS</i> | -0,696 | -13,87***                   | 9,175      | 214,02***            | 9,746     | 312,81***            |
|                | <i>M3</i>   | 0,943  | -22,88***                   | 5,182      | 840,6***             | 6,249     | 847,26***            |

Notes: \*, \*\* and \*\*\* : significant at the 10%, 5% and 1% level.

1 ECOWAS: Benin, Burkina Faso, Côte d'Ivoire, Guinea, Mali, Guinea-Bissau, Gambia, Ghana, Senegal, Niger, Nigeria, Togo, Nigeria, Cape Verde, Sierra Leone.

2 WAEMU with common currency: Benin, Burkina Faso, Côte d'Ivoire, Mali, Senegal, Niger, Togo, Guinea-Bissau.

The results (reported in table 1) show that all the variables are stationary after differencing once. We can suppose that the series *GDP*, *DCPS* and *M3* in panel 1 and panel 2 are integrated of order 1  $I(1)$ . Hence, it is possible to investigate the existence of a cointegrating relationship.

### 2.3 Results of panel cointegration tests

To examine the possible existence of one or more cointegrating relationships among the series considered (in the long term), we use the now well-known test of Pedroni (1999; 2004). The tests verifying null hypothesis of no cointegration consist in testing the presence of a unit root of the residuals. The main advantage of the Pedroni method is to take into account the heterogeneity under the alternative hypothesis for the three *between* statistics.

**Table 2. Pedroni's test results**

|                                   | <b>Panel 1</b>                   | <b>Panel 2</b>                   |
|-----------------------------------|----------------------------------|----------------------------------|
| <b>Statistic</b>                  | <b>Panel Standardized Values</b> | <b>Panel Standardized Values</b> |
| <b><i>v</i>-Statistic Panel</b>   | 3.9337***                        | 1.3077*                          |
| <b><i>rho</i>-Statistic Panel</b> | -1.5090*                         | -2.4404***                       |
| <b><i>PP</i>-Statistic Panel</b>  | -1.3360*                         | -2.3220***                       |
| <b><i>ADF</i>-Statistic Panel</b> | -1.4465*                         | -0.8866                          |
| <b><i>rho</i>-Statistic Group</b> | -1,4436*                         | -2,0572**                        |
| <b><i>PP</i>-Statistic Group</b>  | -1,6442**                        | -2,4097***                       |
| <b><i>ADF</i>-Statistic Group</b> | -0,9493                          | -1,691**                         |

*Notes: \*,\*\* and \*\*\* are significant at the 10%, 5% and 1% level respectively. A constant was included. Panel referred to the within dimension and Group referred to the between dimension.*

In the table 2, Pedroni's test shows that six statistics lead to the rejection of the null hypothesis of no cointegration and conclude in the existence of cointegration. So, we can assume the existence of a long-run relationship between variables.

### 2.4 The long-term relationship

After acceptance of cointegration, we can estimate a long-run relationship between the three variables. We estimate the models with the Dynamic OLS (DOLS) estimator proposed by Kao and Chiang (2000), which outperforms both the OLS and FMOLS (Fully Modified OLS) estimators (Mark and Sul, 2003). The DOLS estimator (with fixed effects) gives the following results in the table 3. Conducting redundant fixed effects tests, we found evidence that these country effects are highly significant.

**Table 3. DOLS model estimation results**

|                       | <b>ECOWAS</b>       | <b>WAEMU</b>        |
|-----------------------|---------------------|---------------------|
| <b>Variables</b>      | <b>Coefficients</b> | <b>Coefficients</b> |
| C                     | 290.27***           | 49.98091**          |
| <i>M3</i>             | -1.03               | 11.11544***         |
| <i>DCPS</i>           | 13.24***            | 3.851899***         |
| <i>dM3(-1)</i>        | -1.60*              | -1.098425           |
| <i>dM3(1)</i>         | -2.09**             | 6.433165***         |
| <i>dDCPS(-1)</i>      | 0.33                | -1.952540           |
| <i>dDCPS(1)</i>       | 9.21***             | -3.616404           |
| <i>R</i> <sup>2</sup> | 0,64                | 0,66                |

Notes: \*,\*\* and \*\*\* : significant at the 10%, 5% and 1% level. The choice of the lags and leads is based on Westerlund method (2005.)

The DOLS estimation shows that there is a significant long-term relationship between *GDP*, *M3* (only at 12% level significance) and *DCPS*. The increase of liquid liabilities (*M3*) negatively influences the economic growth rate of *GDP* in the ECOWAS zone, because in ECOWAS there are different currencies. They have a preference for private credit currency that to hold liquid liabilities in foreign currency. Term deposits of foreign currencies, foreign currency deposits negotiable certificates of deposit, the stock of foreign currency debt liquids become very weak. Thus liquid liabilities are negatively correlated with economic growth in ECOWAS. Moreover, domestic credit (with 1% level significance) contributes to economic growth. It seems that *DCPS* is preferred to liquid liabilities.

Unlike the countries of ECOWAS, WAEMU countries with a common currency have the same preference for private credit (*DCPS*) and liquid liabilities (*M3*) detention of foreign currency. The positive relationship between the variables could be interpreted as all liquid liabilities, the stock of foreign currency debt liquids become very demand. Thus liquid liabilities and domestic credit to the private sector contribute to economic growth in the WAEMU. The use of the common currency promotes financial stability and contributes to the increased demand of domestic credit and liquid liabilities and they allow economic growth, (García-Herrero and Wooldridge, 2007) with a significance of 1% respectively.

## 2.5 Short-run and panel causality results

We estimate a trivariate panel-based Vector Error Correction Mechanism model to examine the correlation and the causality between financial development and economic growth in the short term. This allows taking into account the dynamics and the impact of financial development on economic growth. In the system (see Damette and Fromentin (2013) for more details), we integrate a matrix of short-run exogeneous structural variables containing domestic credit to *GDP* (*DCPBS*) and bank liquid reserves to bank assets (*BLRBAR*).

$$\Delta GDP = \alpha_1 + \sum_k \beta_{11ik} \Delta GDP_{it-k} + \sum_k \beta_{12ik} \Delta M3_{it-k} + \sum_k \beta_{13ik} \Delta DCPS_{it-k} + \lambda_{1i} ECM_{it-1} + \Delta Z_{it-k} + e_{it}$$

$$\Delta M3 = \alpha_2 + \sum_k \beta_{21ik} \Delta GDP_{it-k} + \sum_k \beta_{22ik} \Delta M3_{it-k} + \sum_k \beta_{23ik} \Delta DCPS_{it-k} + \lambda_{2i} ECM_{it-1} + e_{it}$$

$$\Delta DCPS = \alpha_3 + \sum_k \beta_{31ik} \Delta GDP_{it-k} + \sum_k \beta_{32ik} \Delta M3_{it-k} + \sum_k \beta_{33ik} \Delta DCPS_{it-k} + \lambda_{3i} ECM_{it-1} + e_{it}$$

Where  $\Delta$  corresponds to the first differences,  $k$  denotes the number of lags,  $\alpha_j$  is the constant affiliated to each equation and  $ECM_{it-1}$  is a one-period lagged error correction term.  $\Delta Z_{it-k}$  denotes a matrix of short-run exogeneous structural variables containing  $DCPBS$  and  $BLRBAR$ .  $e_{it}$  are serially uncorrelated error terms.

Considering the endogeneity issue due to the collinearity between the one-period lagged error term and the lagged dependent variables, a dynamic panel Generalized Method of Moments (GMM) estimator is needed. The p.value of the J-Statistic is significantly up to 5% level significance.

**Table 4. Causality results (ECOWAS)**

|                       | $\Delta GDP$ | $\Delta M3$  | $\Delta DCPS$ |
|-----------------------|--------------|--------------|---------------|
| C                     | 12.07952***  | 0.435630     | 0.186832      |
| $\Delta GDP_{t-1}$    | 0.091197     | 0.405182**   | 0.018575      |
| $\Delta M3_{t-1}$     | -4.967482*** | 0.635833     | -0.298078*    |
| $\Delta DCPS_{t-1}$   | 0.517862***  | 0.071318*    | 0.029342*     |
| $ECM_{it-1}$          | -0.410536*** | -0.131547*** | -0.037555***  |
| $\Delta BLRBAR_{t-1}$ | -0.137574    |              |               |
| $\Delta DCPBS_{t-1}$  | 0.211802**   |              |               |

Notes : \*,\*\* and \*\*\* : significant at the 10%, 5% et 1% level.

In the short term (as in the long term), there is a negative relationship between liquid liabilities ( $M3$ ) and economic growth. Liquid liabilities don't contribute to economic growth in ECOWAS. Economic agents don't have confidence in the possession liquid liabilities in foreign currency. They prefer the domestic credit ( $DCPS$ ) that encourages economic growth. Similarly domestic credit provided by banking sector ( $DCPBS$ ) introduced in our model in the form of structural variable become quite large and therefore contributes to economic growth. Note also that the impact of  $M3$  and  $DCPS$  is not only transitory (the lagged ECM term is significant at the 1% level). We can mention that  $GDP$  positively influences  $M3$  in the short run.

**Table 5. Causality results (WAEMU)**

|                       | $\Delta GDP$ | $\Delta M3$ | $\Delta DCPS$ |
|-----------------------|--------------|-------------|---------------|
| C                     | 6.760860*    | 0.350763*   | 0.037398      |
| $\Delta GDP_{t-1}$    | 9.259986**   | -0.151428   | 0.159064*     |
| $\Delta M3_{t-1}$     | -1.136364    | -0.010603   | 0.023243      |
| $\Delta DCPS_{t-1}$   | 0.444722**   | 0.005316    | 0.015629**    |
| $ECM_{it-1}$          | -0.042250    | 0.002864    | 0.001399      |
| $\Delta BLRBAR_{t-1}$ | 2.171977*    |             |               |
| $\Delta DCPBS_{t-1}$  | -0.096787    |             |               |

Notes: \*,\*\* and \*\*\* : significant at the 10%, 5% and 1% level

The results derived by the system GMM method display that the variation of *DCPS* in WAEMU positively influences economic growth in the short term. Moreover, it seems that banks increase their liquid reserves to bank assets ratio (*BLRBAR*) to prevent bank failures and this variation contributes to economic growth which significant at 10%. Note also that *GDP* positively influences *DCPS* in the short run.

### 3. Summary and conclusions

This article investigates the relationship between financial development and economic growth in two panels of 15 ECOWAS and 8 WEAMU countries with a trivariate panel-based vector error correction mechanism model.

Our results suggest that in the long-term as in the short-term, financial development leads more economic growth in countries which used common currency (WEAMU) than countries using different currencies (ECOWAS). Our findings argued that in long-term the use of common currency promotes financial stability and allow the same preference of demand domestic credit to private sector and liquid liabilities in foreign currencies both contribute to economic growth in the WAEMU. In ECOWAS zone, in long-term (as in short-term), economic agents prefer detente domestic credit. Unlike the countries of ECOWAS, WAEMU countries with a common currency have the same preference for private credit and liquid liabilities detention of foreign currency. The positive relationship between these variables could be interpreted as in all liquid liabilities, the stock of foreign currency debt liquids become very demand. Thus, liquid liabilities and domestic credit to the private sector contribute to economic growth in the WAEMU. This is in line with the literature (Compton and Giedeman, 2011).

The results of this article suggest that accelerating the process of creation of common currency for all West African countries may intensify the relationship between financial development and economic growth.



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