**Financial development and poverty reduction in crisis periods:** **A panel data evidence from six of** [**ECOWAS**](http://www.ecowas.int/) **countries**

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**Abstract:** In this article, we analyze the direct effect of financial development on poverty in crisis periods for a panel of ECOWAS sample composed of six countries (Ivory Coast, Senegal, Gambia, Ghana, Mali and Benign) during the period 1996-2015, using econometric tests and static panel data. The main empirical result of this study is that the financial development indicators and poverty are significantly and negatively correlated. The results support the fact that financial development reduces directly poverty by increasing access for poor population to various sources of financing. As a result, finance makes transactions easier, provides opportunities for smoothing consumption and asset accumulation, and enables poor households to better cope with shocks, thus reducing the risk of recrudescence into poverty.

**Keywords:** Poverty, financial development, crisis, panel data, econometric tests, ECOWAS countries.

**JEL classification:** I32, O16, C23, C01

# Introduction

The majority of empirical works condenses on the study of the effects of financial development on economic growth and abandons their direct effects on poverty. They argue that increasing national wealth reduces the poverty rate. Moreover, even if one agrees that financial development affects economic growth positively, it is unlikely that this growth will increase the incomes of the poor and reduce poverty accordingly. The aim of this paper is to clarify the effects of financial development on poverty in times of crisis by proposing several estimation methods, based on a series of econometric tests. We consider this paper an in- depth empirical assessment of the direct relationship between financial development (banking and monetary systems) and poverty. We use panel data modeling as well as time series and cross sectional studies. The panel data analysis relates mainly to heterogeneity among individuals. In other words, it allows us to examine the behavioral diversity of agents.

# Theoretical literature

In the economic literature, the arguments that can justify the direct impact of financial development on poverty are of the order of three: the McKinnon Conduit Effect, the Shaw intermediation effect and the thresholds effect.

The conduit effect was initially suggested by McKinnon (1973). In explaining this effect, McKinnon states that when poor enter the financial system as savers, the conduit effect is likely to have a reducing impact on financial development for the well-being of the poor. McKinnon assumes that the investment is indivisible. This hypothesis is verified since the representative economic units in the McKinnon study are formed by "small peasants or poor artisans". In addition, investor-savers have limited access to external financing. Any prior accumulation (savings), in the form of real assets or cash balances, always precedes any expenditure devoted to investment. Thus, self-financing represents itself as the capital source of the investment of the poor.

Shaw (1973) pioneered the theory of the “intermediation effect”. Financial deepening helps to facilitate access to credit for the poor and can therefore benefit from it. Shaw's studies have found that an increase in the interest rate on deposits stimulates savings. In this case, the banks can reap significant savings and therefore they give more credit to investors whose poor can benefit. Thus, investment which is financed externally increases.

The thresholds effect is based on the following assumption: “As the financial system grows, it may expand its services to the poor”. In other words, assuming that the financial system grows, the result is that poor's access to financial services becomes more and more profitable. Thus, in order to extend these services to the poor in an efficient and competitive way, it is essential that the financial system reaches a certain threshold of development (e.g. Aghion, Howitt and Mayer-Foulkes, 2004).In developing countries where the financial system is not sufficiently developed, the poor move towards the non-formal financial system and oust the formal financial system. As a result, three major factors hinder their access to formal credit markets and/or financial services: the lack of acceptable or sufficient guarantees, the physical constraints and the lack of financial institutions that specialize in financial services offered to the poor.

In summary, theoretical arguments presage three direct effects of financial development on poverty reduction. These effects are the McKinnon conduit Effect, the intermediation effect of Shaw and the effect of the thresholds. If the McKinnon conduit Effect and the effect of the thresholds require measures to free financial systems from constraints and restrictions that handicap their development in the supply of financial services to the poor (Kpodar, 2004), the intermediation effect of Shaw requires putting implementation of these measures within well-defined deadlines. In addition, other empirical studies complete these theoretical works.

# Empirical literature

On the empirical level, Jalilian and Kirkpatrick (2002), Honohan (2004), Beck and al. (2007) and Boukhatem and Mokrani (2012) find that the degree of financial intermediation has a positive impact on the income of the poor. Jalilian and Kirkpatrick (2002) use the GDP rate of return to interpret the payment process in a low-income sample. Honohan (2004), Beck and al. (2007), Boukhatem and Mokrani (2012) focus on developing countries and the role of finance measured by the ratio of private sector credit as a percentage of GDP. By using 28 Indian states, Inoue and Hamori (2012) find similar results concerning credits and deposits. Previously, from 1988 to 1997, Kpodar (2004) shows that the financial development has measured the liabilities of financial institutions in the proportions of GDP, the transactions of

commercial banks in GDP and credit in the private sector in GDP are likely to reduce absolute poverty or the income of the 20 % poorer.

On the other hand, Dollar and Kraay (2002) and more recently Fowowe and Abidoye (2012) found that financial development had no effect on the poor. Fowowe and Abidoye (2012) used a private credit as a financial development measure and examine its effects on poverty in a sample of countries in sub-Saharan Africa. Their empirical results show that this indicator of financial development does not significantly influence poverty in these countries. Yet macroeconomic variables such as the rate of trade openness and low inflation lightened poverty level.

Finally, Donou-Adonsou and Sylwester (2016) and Guillaumont-Jeanneney and Kpodar (2008, 2011) find that the contribution of financial development to the reduction of poverty depends on the transmission channels. Guillaumont-Jeanneney and Kpodar (2008), find that a negative and significant relationship has been created between financial development and poverty f the financial development indicator is Money supply to GDP ratio M3. If the private credit to GDP is used, the link is statistically insignificant. Their findings suggest that the poor mainly benefit from the ability of the banking system to facilitate transactions and provide savings opportunities rather than benefit from improved access to credit. Donou- Adonsou and Sylwester (2016) applied the instrumental variables approach in a panel of 71 developing countries over the period 2002-2011. Using the private credit ratio as a percentage of GDP, the estimation results show that banks reduce poverty when the incidence is reduced. On the other hand, using microfinance institutions (MFIs) as a financial development measure, this indicator does not appear to have the negative impact on poverty. These results imply that banks have some ability to reduce poverty, MFIs do not. These are robust results that have been used in GDP as an alternative measure of financial development. Guillaumont- Jeanneney and Kpodar (2011) show that financial development is beneficial for the reduction of poverty through the effect of McKinnon's capital. They also find that financial instability is a source of disruption that has adverse effects on poverty.

More recently, Samhaz (2009) shows that private credit to GDP helps to reduce poverty in Pakistan. This result has been confirmed by Khan and al. (2012). Chemli (2014) states that private credit relative to GDP is positively associated with lower poverty in Algeria, Iran, Jordan and Tunisia. Quartey (2005) and Odhiambo (2009b) achieve similar results for Ghana and Zambia, respectively. Using M2 on GDP, Odhiambo (2009a) concluded that financial development in the sense of Granger involved poverty reduction in South Africa, while Odhiambo (2009b) proved the opposite case in Zambia. Meanwhile, Aye (2013) finds no long-term relationship between financial development and poverty reduction in the case of Nigeria. Finally, Uddin et al. (2013) find that financial development does not contribute to poverty alleviation in Bangladesh, while Shabhaz and Rehman (2013) find that financial development makes sense of poverty reduction in Pakistan. Regarding the possibility of a non-linear relationship between financial development and poverty, Beck and al. (2007) use the square term of private credit, but the coefficient is never statistically significant.

# Data used and econometric Methodology

* 1. Presentation of data and model

Data were extracted from the World Bank (World Development Indicators 2010) spanning the period 1996-2015. Our original purpose was to insert all ECOWAS countries, but all data are available only for 6 countries (Ivory Coast, Senegal, Gambia, Ghana, Mali and Benign). Beside, the number of observations is expected to be similar across countries leading to estimations over a balanced panel data. Poverty data are characterized by a number of missing observations. In order for the balanced databases to be complete (Bangoura and al. 2016), we have tried to fill the gaps by using a simple extrapolation method on the previous or historical value. According to Little and Rubin (2002), if the percentage of existing values was variable up to 5%, the values cannot be excluded or deleted. So, it is essential to change each missing value by an imputed value.

Our econometric model with panel data is inspired by the studies of Kpodar (2004) and Guillaumont-Jeanneney and Kpodar (2008) in which the poverty indicator is regressed on the indicator of financial development and a set of variables of control presented by the following expression:

PVit   i +  0 + 1FDit + 2Ln (Y)it + 3crisis + 4INFit + 5OPNit + 6GINIit + 7GVit + 8UNPit +

9EDU it + 10HEL it + 11TELit + i

(1)

Where PVit

refers to the matrix of indicators of poverty presented by the headcount poverty

and the poverty gap. Headcount poverty (PV1) denotes the proportion of population living below the international poverty line of 1.9$ a day following Honohan (2004). Poverty gap (PV2) measures the average distance between the income of the poor population and the poverty line. According to Guillaumont-Jeanneney and Kpodar (2008), this indicator makes it possible to determine the extent to which poor population are below or above the poverty line. FDit is the level of financial development including banking and monetary variables. Money supply to GDP ratio (M3) measures the liquidity’s degree of the financial system, presented by the “McKinnon Conduit Effect”. To measure bank development, we use the variable (CB) which equals the domestic credit provided by the banking sector divided by GDP. We use also private credit (CP) which equals the value of credits by financial intermediaries to the private sector divided by GDP following Levine and Zervos (1998); Rousseau and Wachtel (2000) and Beck and Levine (2004). In general, (M3) and (CP) are commonly used in empirical studies to estimate the impact of financial development on poverty (e.g. King and Levine, 1993; Levine, Loayza and Beck 2000 and Kpodar, 2006).On the other hand, we introduce the natural logarithm of GDP per capita (Ln (Y)) which controls the impact of economic growth on poverty following Beck, Demirgüç-Kunt and Vojislav (2006).To account for financial instability, we include the recurrence of crisis (crisis). It is a dichotomous variable that takes the value of 1 in the period of crisis and 0 otherwise. We take into account crises that started from 1996 to 2015: the Asian crisis (1997), the Russian crisis (1998), the Brazilian crisis (1998-1999 ), the crisis of Turkey (2000), the stock market crash of 2001- 2002, the economic crisis of Argentina (2001), the attacks of September 11 (2001) in the United States, the Brazilian crisis (2002), the global financial crisis: “subprime” crisis (2007- 2009) and finally the Greece crisis (2009). Inflation rate (INFit ), measured by the consumer price index and reflects the effect of macroeconomic stability on poverty. Rate of trade openness (OPNit), measured by the ratio of the sum of exports and imports of goods and services to GDP and reflects the trade integration policy on poverty. Inequality index (GINIit ) measures inequality of income distribution. It ranges from 0 (distribution is uniform and perfectly equal, where households have the same income) to 1 (where distribution is perfectly

unequal). GVit

denotes the ratio of government consumption to GDP. This variable is used by

various practitioners as a control variable for government intervention. In order to capture the effect of the labor market on poverty, we use the rate of the Unemployment (UNP).

Additional control variables that includes the ratio of public expenditure in education to GDP ( EDUit ) and the ratio of public expenditure in health to GDP ( HLTit ) to capture the impact of human capital investment on poverty (e.g.Agénor, 2003). Last, we include the infrastructure indicator ( TELit ), measured by the number of telephone line (by 100 capita).This indicator contributes both to the economic growth and the improvement of the population's living standards. Finally, i is an unobserved country specific effect; i is the error term with Eit  0i, t; i is the county and t is the time period.

* 1. Econometric methodology

Before the implementation of our econometric model, we verify the homogeneity or heterogeneity of the data generating process. Econometrically, it comes down to testing whether the coefficients of the model retained are equal in the individual dimension. We test the overall homogeneity of behaviors (constants) in time and space with the Fisher test. In the case where the sample is totally homogeneous, we use the MCO on panel data. In the case of heterogeneous behaviors, we choose between the fixed-effect model and the random-effect model according to the results obtained by the Hausman (1978) specification test. If the model to be retained is a fixed effect Model or Random Effects Model, we use then the Wooldridge (2002) autocorrelation test. In such a case, our estimators will be biased. Thus, if the errors are autocorrelated, we apply Baltagi and Wu (1999) first-order autocorrelation correction method to reduce this potential bias. We test the heteroscedasticity of the errors with Breush-Pagan (1979) test. Such heteroscedasticity is then corrected by the method of White (1980). If the errors are both heteroscedastic and autocorrelated, we use the Quasi Generalized Least Squares (MCQG) method. This method has been used, in particular by Dutta and Osei-Yeboah (2008). We suspect endogeneity of the explanatory variables. We refer to the test of Nakamura Nakamura (1981). Finally, we discuss the results obtained.

# Results and discussions

From the Correlations Table 1 between poverty indicators and financial development indicators, it can see that all Pearson’s correlations coefficients are negative.

**Table1**

Correlation between poverty and financial development indicators

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | PV1 | PV2 | M3 | CB | CP |
| PV1 | 1.0000 |  |  |  |  |
| PV2 | 0.9412\*  (0.0000) | 1.0000 |  |  |  |
| M3 | -0.2573\* (0.0046) | -0.2859\* (0.0016) | 1.0000 |  |  |
| CB | -0.4920\* (0.0000) | -0.4143\* (0.0000) | 0.7382\* (0.0000) | 1.0000 |  |
| CP | -0.2405\*  (0.0081) | -0.2994\*  (0.0009) | 0.5208\*  (0.0000) | 0.3848\*  (0.0000) | 1.0000 |

*Notes:* \*indicate statistical significance respectively at 10%; Numbers in parentheses under the coefficients are p-values.

Turning to the correlation between financial development indicators, there is a positive and significant correlation between them. Furthermore, values are at high levels. In fact, this suggests that these indicators capture the same information. We register also the highly positive correlation between the money supply to GDP ratio and the domestic credit provided

by the banking sector to GDP ratio (0.7382). As shown by Kpodar (2006), financial development indicators are negatively correlated with poverty and positively correlated with each other.

60

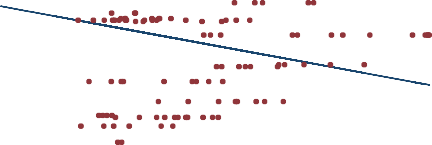
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**Fig. 1.** Relationship between Headcount poverty and Money supply to GDP ratio



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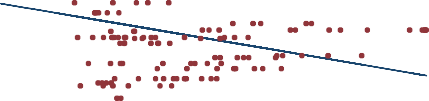
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50

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M3

Fitted values PV1



10

20

30

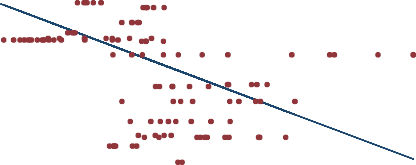
40

50

60

M3

Fitted values PV2



0

20

40

60

CB

Fitted values PV1

60

80

20

40

20

30

40

50

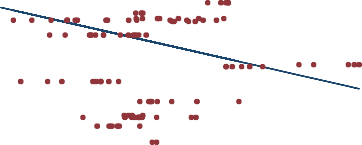
10

20

0

**Fig. 4.** Relationship between Poverty gap and Money supply to GDP ratio

**Fig. 2.** Relationship between Headcount poverty and domestic credit provided by the banking sector divided to GDP ratio



0

10

20

CP

Fitted values

30

40

PV1

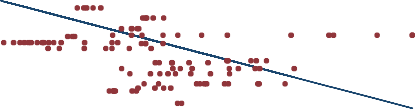
20

40

60

80

**Fig. 5.** Relationship between Poverty gap and domestic credit provided by the banking sector divided to GDP ratio



0

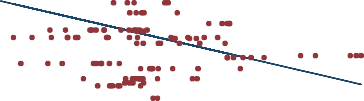
20

40

60

CB

Fitted values PV2



0

10

20

CP

Fitted values

30

40

PV2

20

30

40

50

10

0

**Fig. 3.** Relationship between Headcount poverty and credits by financial intermediaries to the private sector divided to GDP

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**Fig. 6.** Relationship between Poverty gap and credits by financial intermediaries to the private sector divided to GDP

10

0

Figures 1, 2 and 3 illustrate the relationship between headcount poverty and financial development. Figures 4, 5 and 6 illustrate the relationship between poverty gap and financial development. We can note that financial development indicators do not favor the two indicators of poverty, with a mighty descending slope which crosses the group of points. A

negative impact of the financial development indicators on the two indicators of poverty can be established.

**Table 2**

Results of Fisher test of global homogeneity

|  |  |  |  |
| --- | --- | --- | --- |
| Endogenous variable: PV1 | M3 | CB | CP |
| F | F(16,103)=4.95 | F (16, 103)=5.33 | F(16,103)=5.11 |
| Prob ˃F | 0.0000 | 0.0000 | 0.0000 |
| Endogenous variable : PV2 | M3 | CB | CP |
| F | F(16,103)=8.16 | F(16,103)=8.82 | F (16,103)=8.21 |
| Prob ˃F | 0.0000 | 0.0000 | 0.0000 |

Firstly, we begin with testing of global homogeneity. The results are shown in Table 2. Indeed, the probability of the Fisher test for the headcount poverty and the poverty gap is close to zero. Therefore, we reject the null hypothesis of the total homogeneity of the constants. On the other hand, we accept the model with individual specific effects (Fixed Effect Model or Random Effect Model).

Tables 5 and 6 set out the results of estimation for the three financial development indicators M3, CB and CP. The statistics of the Hausman test for headcount poverty appear with a probability Prob ˃ 5%. Thus, we keep the Random Effect Model for the three indicators of financial development. It is globally significant with a zero probability of the Wald Chi2 test for the whole of specifications. Before proceeding with discussions of the results of estimation, we carry out a set of tests in order to perceive the possible problems that may persist on the data. We examine whether the autocorrelation and the heteroscedasticity across errors. Also, we carry out the Nakamura Nakamura test in order to control the endogeneity bias.

**Table 3**

Results of Wooldridge test of autocorrelation

|  |  |  |  |
| --- | --- | --- | --- |
| Endogenous variable: PV1 | M3 | CB | CP |
| F | F(1,5)=1.625 | F (1,5)=43.777 | F(1,5)=6.600 |
| Prob ˃F | 0.2584 | 0.0012 | 0.0501 |
| Endogenous variable : PV2 | M3 | CB | CP |
| F | F(1,5)=2.478 | F(1,5)=27.536 | F (1,5)=6.747 |
| Prob ˃F | 0.1763 | 0.0033 | 0.0484 |

Results of Wooldridge test1 for the variable M3 show that the null hypothesis of no autocorrelation in order 1 is accepted at the 5% since the probability of this test is greater than 5% for the two poverty indicators. So we do not need to make such a correction. On the other hand, for the variable CB, the probabilities associated to the Wooldridge test are less than 5% for the two indicators of poverty. In this case, we take again the estimation of the Random

1*The Wooldridge test (2002) is programmed on the "xtserial" command. A second way to do the autocorrelation test is to proceed indirectly using the "xtregar" command.*

Effects Model by using the method of Baltagi and Wu2. For the variable CP, we estimate the Random Effects Model by using the method of Baltagi and Wu for the poverty gap.

**Table 4**

Results of Breusch-Pagan test of heteroscedasticity

|  |  |  |  |
| --- | --- | --- | --- |
| Endogenous variable : PV1 | M3 | CB | CP |
| R² | 0.6901 | 0.6893 | 0.6893 |
| Khi2 calculated | 82.812 | 82.716 | 82.716 |
| Endogenous variable : PV2 | M3 | CB | CP |
| R² | 0.6623 | 0.6632 | 0.6630 |
| Khi2 calculated | 79.476 | 79.584 | 79.56 |

*Notes:* Under a Chi-square law at k-1 degrees of freedom; N and R² are respectively the number of observations and the coefficient of determination of the model of step 3 and k is the number of explanatory variables including the constant; Tabulated Chi2 is 19.6751 for dd1 = 11 and α = 5%; \*, \*\*, \*\*\* indicate statistical significance respectively at 10%, 5% and 1%.

The results of the Breusch-Pagan of heteroscedasticity test show that all Breusch-Pagan statistics for the two indicators of poverty are greater than the tabulated value. Therefore the errors are heteroscedastic whatever the indicator of the financial development used.

**Table 5**

Results of Nakamura Nakamura test of endogeneity

|  |  |  |  |
| --- | --- | --- | --- |
| Endogenous variable: PV1 | M3 | CB | CP |
| Résidus1 (associated to DF) | 4.543012  (0.130) | -1.465696  (0.491) | 26.8704  (0.304) |
| Résidus2 (associated to Ln(Y))  Résidus3 (associated to GINI) | 9.191219  (0.188)  0.7156593  (0.416) | 2.793045  (0.174)  -0.3834397  (0.442) | 2.383958  (0.132)  2.43887  (0.217) |
| Endogenous variable: PV2 | M3 | CB | CP |
| Résidus1 (associated to FD) | 3.309656  (0.120) | -0.6115025  (0.673) | 18.45365  (0.303) |
| Résidus2 (associated to Ln(Y))  Résidus2 (associated to GINI) | 8.393632  (0.106)  -0.9033365  (0.289) | 2.49063\*  (0.099)  -0.3970353  (0.299) | 2.036284\*  (0.085)  2.049209  (0.166) |

Also, we carry out the Nakamura Nakamura test in order to control the endogeneity bias. According to Kpodar (2004), the financial development variables, Ln (Y) and GINI can be suspected of endogenous to poverty indicators, in other words they can be correlated with the errors. To solve this problem, lagged financial development indicators of one period, lagged Ln (Y) variable of one period and lagged GINI of one period were chosen as instrumented variables. The Nakamura Nakamura test results show that the endogeneity hypothesis has been rejected at 5%. As a result, the financial development variables (M3, CB and CP), Ln (Y) and GINI are not endogenous.

*2 The method of Baltagi and Wu is preprogrammed on STATA 12 under the command "xtregar".*

**Table 6**

Direct impact of financial development on headcount poverty in ECOWAS: static panel model results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variables | REM | REM | REM with AR(1)  disturbance | REM |
|  | (1) | (2) | (3) | (4) |
| M3 | -0.233\* (0.060) |  |  |  |
| CB |  | -0.261\*\* (0.012) | -0.266\*\*\*(0.010) |  |
| CP |  |  |  | -0.374\*(0.083) |
| Ln(Y) | -16.422\* (0.084) | -14.974 (0.109) | -15.302\*(0.093) | -14.262 (0.133) |
| Crisis | 0.991\* (0.093) | 0.898 (0.131) | 0.891 (0.136) | 0.837 (0.165) |
| INF | -0.062(0.173) | - 0.057 (0.205) | -0.0568 (0.211) | -0.063 (0.167) |
| OPN | 0.006 (0.790) | -0.001 (0.994) | -0.001(0.970) | 0.002 (0.911) |
| GINI | 1.4\*\*\* (0.000) | 1.424\*\*\* (0.000) | 1.422\*\*\*(0.000) | 1.425\*\*\* (0.000) |
| GV | -0.973\* (0.075) | -0.942\* (0.081) | -0.926\*(0.085) | -0.905\* (0.098) |
| UNP | 0.517 (0.161) | 0.502 (0.166) | 0.498 (0.168) | 0.474 (0.197) |
| EDU | 0.457 (0.398) | 0.468 (0.376) | 0.477 (0.366) | 0.401(0.455) |
| HLT | -2.732\*\*(0.003) | -2.783\*\*\* (0.002) | -2.776\*\*\* (0.003) | -2.846\*\*\* (0.002) |
| TEL | -0.099 (0.947) | -0.803 (0.587) | -0.798 (0.589) | -0.375 (0.801) |
| Constant | -0.417 (0.788) | 0.02 (0.990) | 0.077 (0.960) | -0.141(0.927) |
| Wald Chi2 test | 77.95(0.000) | 82.54 (0.000) | 82.61 (0.000) | 77.10 (0.000) |
| Hausman test (Prob) | 0.9944 | 0.9804 |  | 0.9414 |
| Number of countries | 6 | 6 | 6 | 6 |

*Notes:* \*, \*\*, \*\*\* indicate statistical significance respectively at 10%, 5% and 1%; Numbers in parentheses under the coefficients are p-values; REM indicates Random Effect Model; AR (1) indicates Durbin*-*Watson test for first order serial correlation.

According to the Table 6, the results of our estimations show that the impact of financial development is always negative with significance varying with the nature of the measure introduced either for monetary development or banking development. Individually, the coefficient associated to BC (Column (3)) is negative and statistically significant with the high level of 1%. At this step, we can note that an increase of 1% of the money supply to GDP ratio will generate a decrease in headcount poverty of 0.233% (Column (2)). For the domestic credit provided by the banking sector divided to GDP, an increase of 1% in this indicator will result a deterioration of the headcount poverty of 0.266% (Column (3)). According to ratio of credits by financial intermediaries to the private sector to GDP, an increase of 1% will reduce the headcount poverty of 0.374% (Column (4)). This last result is confirmed with the studies of Beck, Demirguc-Kunt and Levine (2007) which affirm that an increased credit to the private sector leads to a decline in people living below the poverty line. Similarly, Honohan (2004a) find a significant and robust impact of financial development (measured by the ratio of domestic credit to the private sector to GDP) on the headcount poverty . Its result suggests that there is a direct relationship between financial development and poverty eradication and that this relationship is independent of the indirect impact via the economic growth. In ECOWAS countries, the growth of the private sector generates employment opportunities through the creation of small and medium-sized enterprises (SMEs). Recently, several private sector studies from World Bank member countries have focused on the role of SMEs in the fight against poverty. Generally, the results of this work reveal that SMEs help to reduce unemployment and thus contribute to alleviating household poverty. Also, Ayyagari, Beck and Demirgüç-Kunt (2007) argue that low entry costs, easy access to finance, availability and dissemination of information lead to an increase in private firms in the manufacturing sector and that SMEs account for around 60% of employment in this sector.

**Table 7**

Direct impact of financial development on poverty gap in ECOWAS; static panel model results

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variables | REM | REM | REM with AR(1)  disturbance | REM | REM with AR(1)  disturbance |
|  | (1) | (2) | (3) | (4) | (5) |
| M3 | -0.161\* (0.080) |  |  |  |  |
| CB |  | -0.202\*\*\* (0.008) | -0.21\*\*\* (0.006) |  |  |
| CP |  |  |  | -0.206 (0.196) | -0.219 (0.172) |
| Ln(Y) | -11.965\* (0.088) | -11.004 (0.109) | -11.423\* (0.097) | -10.52237 (0.134) | -11.349 (0.109) |
| Crisis | 0.552 (0.219) | 0.496 (0.255) | 0.494 (0.260) | 0.442 (0.320) | 0.44 (0.330) |
| INF | -0.049 (0.145) | -0.045 (0.168) | -0.045 (0.175) | -0.049 (0.147) | -0.048 (0.164) |
| OPN | 0.004 (0.812) | -0.001 (0.976) | -0.001 (0.946) | 0.001 (0.930) | 0.001 (0.983) |
| GINI | 1.565\*\*\* (0.000) | 1.585\*\*\* (0.000) | 1.583\*\*\* (0.000) | 1.578\*\*\* (0.000) | 1.574\*\*\* (0.000) |
| GV | -0.793\*\* (0.049) | -0.775\*\* (0.050) | -0.754\* (0.055) | -0.747\* (0.065) | -0.713\* (0.076) |
| UNP | 0.253 (0.352) | 0.249 (0.349) | 0.244 (0.355) | 0.217 (0.424) | 0.213 (0.431) |
| EDU | 0.554 (0.165) | 0.584 (0.132) | 0.597 (0.123) | 0.49 (0.218) | 0.503 (0.205) |
| HLT | -1.839\*\*\* (0.007) | -1.874\*\*\* (0.006) | -1.876\*\*\* (0.005) | -1.91\*\*\* (0.006) | -1.911\*\*\* (0.006) |
| TEL | -0.34 (0.758) | -0.857 (0.429) | -0.865 (0.424) | -0.538 (0.626) | -0.534 (0.628) |
| Constant | -0.174 (0.878) | 0.155 (0.890) | 0.209 (0.855) | -0.009 (0.993) | 0.081 (0.946) |
| Wald Chi2 test Hausman test (Prob) | 130.26\*\*\*  0.9933 | 138.80\*\*\*  0.9758 | 139.32\*\*\* | 127.26\*\*\*  0.9497 | 126.96\*\*\* |
| Number of countries | 6 | 6 | 6 | 6 |  |

*Notes:* \*, \*\*, \*\*\* indicate statistical significance respectively at 10%, 5% and 1%.; Numbers in parentheses under the coefficients are p-values; REM indicates Random Effect Model; AR (1) indicates Durbin*-*Watson test for first order serial correlation.

In columns (1), (3) and (5) of Table 7, results suggest that the ratio of money supply to GDP ratio and the domestic credit provided by the banking sector to GDP are negative and significantly correlated with poverty gap. The effect of financial development on poverty reduction is more powerful in the case of the headcount of poverty than in the poverty gap. In fact, an increase in a point of the percentage of M3 reduces the poverty of 0.161%. These results support the McKinnon Conduit Effect. Also, an increase in CB from 1% will lead to a reduction of the poverty gap of 0.209%. In contrast to headcount poverty, CP is not significant. So, financial development contributes directly to poverty reduction by improving the access of poor population to financial services, which is in conformity with theoretical analyzes and thus corroborate with empirical studies (e.g. Odhiambo, 2009, Akhter, Liu and Daly, 2010 and Boukhatem and Mokrani, 2012).

In Tables 6 and 7, results of estimation of the direct impact of the money supply to GDP ratio and domestic credit provided by the banking sector to GDP ratio on headcount of poverty and poverty gap suggest that the growth rate of the GDP per capita is negative and statistically significant at 10%. The hypothesis of a negative effect of economic growth on the poverty is not rejected. Delande (2008) affirms that economic growth improves the standard of living of poor and more precisely it accelerates the reduction of poverty. In addition, Lustig, Arias and Rigolini (2002) and Inoue and Hamori (2012) argue that economic growth is an instrument to reduce poverty. However, this positive effect can be hindered and slowed down by the presence of income inequalities. As Guillaumont-Jeanneney and Kpodar (2004), the results related to the indicator of financial instability, measured by the dummy variable

(crisis) has a positive effect on poverty. In some developing countries, setting up safety nets such as social assistance programs, conversion aids, etc can reduce the negative effect of financial instability and especially the effect of banking crisis. With regard to the variable (INF) which captures the effect of macroeconomic stability on poverty, it has a negative sign but its coefficients are not significant at conventional levels. These results are in conformity with those found by an abundant number of economists, such as Levine and Renelt (1992), Fisher (1993) and Baldacc, De Mello and Inchauste (2002) who argue that the relationship between inflation and poverty is negative. Similarly, Dollar and Kraay (2002) show that the impact of the inflation rate on the income of the poorest 20% population is negative. Inflation is a factor which can erode purchasing power, makes false the expectations of agents, attenuates the value of assets and penalizes relatively more the poor since their assets are not indexed to inflation. Also, high inflation hampers countries' economic convergence. On the other hand, by introducing the variable OPN, we notice that coefficients are sometimes positively, sometimes negatively the indicators of poverty. Inoue and Hamori (2012) agree that trade openness helps to eradicate poverty in developing countries. The surprising positive sign of trade openness may, however, be explained by the risk of a broad opening to foreign capital flows. A second explanation relates to the fact that financial globalization is likely to increase income inequality when only some countries take advantage of its favorable effects. In addition, the coefficient associated to the GINI index is positive and statistically significant at a high level, reflecting the positive effect of the income inequality index on poverty found by Bamba (2001) and Meng, Gregory and Wang (2005) who note empirically that there is a positive relationship between poverty and the level of inequality income, adding that a high inequality can negatively affect poverty. Similarly, this result is corroborated by studies of Ravallion (2005) and Mchiri Moudden (2011) who affirm that high inequality can deteriorate the situation of the poor. Unemployment (UNM) contributes positively to reducing poverty. Thus a 1% increase in unemployment leads to an increase of poverty. According to the variable (GV), the results of the different estimates indicate that the coefficient associated with this variable is statistically significant. By introducing the variable (GV) that represents public expenditure (% of GDP), the results of different estimations indicate that only all coefficients associated to this variable is statistically significant at 1%. With regard to education expenditure (EDU), the results show that there is a positive and surprising relationship between this variable and poverty indicators. In other hand, we find that health expenditure (HEL) is negative and significantly correlated with poverty at 1%. An increase in spending on health helps to reduce headcount poverty and poverty gap. According to Castro- Leal, Dayton, Demery and Mehra (2000), the solution is not only to increase budgets for health but also to break down all the constraints that prevent poor of benefiting from social services subsidies. In order to examine the impact of infrastructure on poverty, we introduce the variable (TEL). All coefficients allotted to this variable are negative but lacked of significance. In fact, this indicator of infrastructure can essentially affect the quality of life of poor. Infrastructure plays a crucial role in the development process. It not only helps to connect operators to markets, reduce factor costs and improve the competitiveness of the economy, but provides also the services to the poor and determines their quality of life. In addition, this indicator promotes both economic growth and improves the standard of living of population. Guillaumont-Jeannenney and Kpodar (2005) affirm this result by revealing that a high road density makes it possible to reduce poverty.

# Conclusion

Using a sample of 6 ECOWAS countries from 1996 up to 2015 for the periods of crisis, this paper tries to study the relationship between financial development and poverty. It tests

the direct impact of both monetary system and bank system on poverty. Generally, we report using static panel and across different control variables that the financial development is important or even harmful for poverty reduction in the ECOWAS countries. As a matter of policy implications, it’s obvious to promote the development of financial systems. In order to affect poor population favorably, financial development must provide them better access to financial services (loans, deposits, insurance, etc.) so that the McKinnon Capital Effect and the intermediation effect from Shaw intervene. Furthermore, policymakers must also consider the risks associated with crisis. Therefore, to encourage financial development polices need to be accompanied by measures to stabilize the macroeconomic environment. In ECOWAS countries, public authorities should mainly support the establishment and development of decentralized financial systems, especially microfinance institutions. Their main purpose is the provision of savings accounts and loans to the poor population. Firstly, these institutions are considered to be financial institutions that specialize in providing financial services to population with limited access to banking services. Secondly, these institutions can overcome the constraint of the absence of collateral by the mobilization of guarantee funds. Finally, since these micro-finance institutions are closer to the poor, they solve the problem of territory coverage of bank branches.

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