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How financial inclusion affects poverty in WAEMU countries?

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***Abstract*---**Financial inclusion as seen from the ease and extent of public access to financial services has become an important issue in economic development. The purpose of the study is to examine how financial inclusion affect poverty in eight countries of West Africa Economic and Monetary Union (WAEMU) between 2007 and 2018.A linear panel model was used to analyse the relationship between financial inclusion and poverty in the WAEMU. The PSCE method was used to estimate the model. The results indicate that financial inclusion has a negative impact on poverty. The study encourages measures to improve the level of financial inclusion.

***Keywords*---**Poverty, Financial inclusion, WAEMU.
JEL Classification: F43, G21, O55

1. Introduction

With inequality on the rise in many countries, the issue of income distribution has received particular attention in recent years. Income inequality has been growing steadily since the late 1990s in both developed and developing countries (Sahay, et al., 2020), and income inequality is fuelling populism and alterglobalism, which can threaten democratic principles, economic growth and stability. The fight against inequality has become a key objective at both national and international level.

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The relationship between financial development and poverty has attracted relatively little attention from researchers. Some authors argue that financial sector growth contributes to poverty reduction through the effect of improved growth, while others suggest that financial development is negatively correlated with inequality. Despite this abundance of literature on the relationship between financial development and growth, similar studies on the role of financial inclusion are not as numerous.

Financial inclusion is generally accompanied by an increase in economic transactions, the opening of savings accounts, payment facilities, access to credit and cash transfers, improved individual and household welfare, increased marginal propensity to save, investment in education and risk management (Ashraf, et al., 2010; Bruhn and Love, 2014; Dupas and Robinson, 2013; Churchill and Marisetty, 2019; Zhang and Posso, 2017).As far as the welfare dimension is concerned, there is research that has examined the effects of financial inclusion on poverty and vulnerability to poverty (Choudhury, 2014).Examples include work on Kenya , Malawi , India , and more recently Middle Eastern and North African countries (Allen, et al., 2012; Brune, et al., 2011; Burgess and Pande, 2005; Neaime and Gaysset, 2018).

Demirguc-Kunt and Klapper (2012) look into empirical evidence on financial inclusion. They consider that the relationship between financial inclusion and inequality is not well understood for several reasons.the first reason is related to the availability of data on financial inclusion. Two data sources are generally used to measure financial inclusion: the World Bank's Global Findex Database and the International Monetary Fund's Financial Access Survey. The Global Findex Database was launched in 2011 and is updated every three years and the FAS in 2004.this temporal weakness explains the number of studies that have examined the link between financial inclusion and macroeconomic variables such as inequality or economic growth. This temporal weakness explains the small number of studies that have examined the link between financial inclusion and macroeconomic variables such as inequality or economic growth. The second reason is that financial inclusion has very recently become a political priority in many countries: the Seoul Summit in 2010 was an opportunity for the G20 leaders to approve the Action Plan on Financial Inclusion and to call for the establishment of a global partnership for financial inclusion.

Apart from the study by Neaime and Gaysset (2018), other studies that have examined this link conclude that financial inclusion significantly reduces poverty. Beyond the link between financial inclusion and poverty, there is empirical evidence of the inequality-reducing effects of financial inclusion. Moreover, these studies do not explain the mechanism or process by which financial inclusion acts on inequalities.

Financial inclusion enables households and businesses to have access to the resources they need to finance their investment and consumption and to raise the level of economic activity. In addition, inclusion makes growth inclusive: access to finance can enable economic agents to take part in long-term participatory investment activities, facilitate the efficient allocation of productive resources,

cope with unexpected short-term shocks and improve the day-to-day management of finances.

Despite rapid progress in reducing poverty, a large proportion of the population still lives in poverty in developing countries, particularly in Asia, Africa, Latin America and the Caribbean. Progress in reducing extreme poverty differs from one region to another and is explained by country-specific factors. Some regions of the world, such as sub-Saharan Africa and South Asia, are still affected by extreme poverty, accounting for 85% of people living below the poverty line. Worse still, according to the World Bank, almost 90% of people affected by extreme poverty will be living in sub-Saharan Africa in 2050.

In Madagascar, more than 75% of the population lives on less than $1.90, according to World Bank statistics. The highest rate of extreme poverty on the continent was 73% in 2018 in the Democratic Republic of Congo. In Mali, on the other hand, the situation is not as bad, with a rate of 42.7% in 2019, while in Senegal the rate is 38%, based on the 2011 threshold. World Bank has naturally set itself the goal of reducing extreme poverty by 2030 and increasing the shared prosperity of the 40% most disadvantaged people in each country by reducing income inequality.

This is why financial inclusion has become one of the priorities on the global reform agenda and is attracting a great deal of attention because of its ability to break the vicious circle of poverty and reduce inequality. In reality, financial systems are far from inclusive, reflecting its potential transformative power to accelerate inclusive development. Given its multifaceted implications, financial inclusion is a central theme for the World Bank (World Bank, 2014). Member countries of the United Nations have made financial inclusion a key objective in their development agenda.

Despite the progress made in this direction, the evidence on the macroeconomic effects of financial inclusion is limited due to the inconsistency of macroeconomic data across countries. Certainly, there are many studies on the determinants of financial inclusion, the appropriate measures and the types of effective financial services. Other studies have discussed the effects of financial inclusion on economic growth, financial stability and women's economic empowerment. However, these results are not sufficient to provide a comprehensive understanding of the macroeconomic implications of financial inclusion.

This research is an attempt to fill this gap by examining the relationship between financial inclusion and poverty for the eight WAEMU countries where the level of financial exclusion is relatively higher than in developed countries. In addition, this study will help to answer the following question: does financial inclusion reduce poverty in WAEMU countries?

This study is intended as a contribution to the literature on financial inclusion through the construction of a synthetic indicator of financial inclusion to better analyse the link between financial inclusion and poverty in WAEMU countries. It also analyses the impact of financial inclusion on poverty reduction. It formulates the hypothesis that financial inclusion reduces poverty in the countries of this

zone. The rest of the study is as follows: section 2 provides a descriptive analysis of poverty in the countries in the zone, section 3 presents the literature, and section 4 presents the analysis methodology. Section 5 presents and discusses the results, and the final section concludes the study

2. The state of poverty in the WAEMU

Poverty reduction is a national priority for WAEMU Member States. It features in their various development plans and strategies. The fight against poverty is an integral part of the Sustainable Development Goals (SDGs) which, as stated in targets 1.1 and 1.2 of SDG 1, aim to reduce by at least half the proportion of men, women and children of all ages living in poverty by 2030, as defined by each country and in all its forms.

Unfortunately, since the advent of Poverty Reduction Strategies in the early 2000s, the fact remains that 44% of the WEAMU's population continues to live below the poverty line in 2015, a figure that reflects the immense efforts that still need to be made to achieve economic performance that will reduce poverty in this area.

The results of the harmonised household surveys on living conditions in the Member States provide an indication of trends over recent years. These results reveal disparities in terms of efforts to reduce poverty in the WEAMU. Figure .1 shows how the poverty threshold has evolved in recent years.

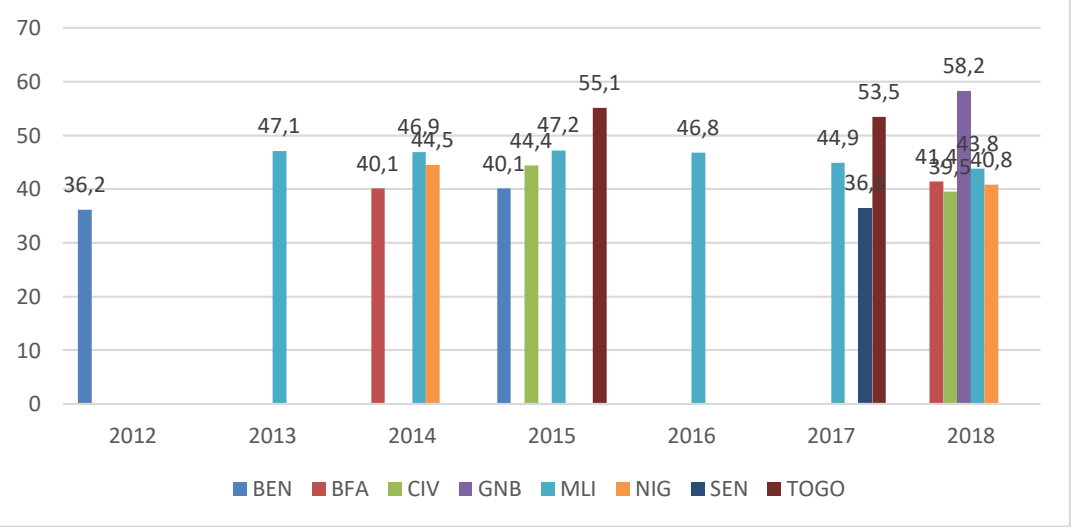

Figure 1: Changes in the poverty threshold in the WAEMU

Source: WDI, 2018. Note: BEN= Bénin, BFA=Burkina Faso, CIV = Cote d'Ivoire, MLI=Mali, NIG=Niger, SEN=Sénégal TGO=Togo

The situation by country is as follows: Benin (40.1% in 2015), Burkina Faso (41.4% in 2018), Cote d'Ivoire (39.5% in 2018), Guinea Bissau (58.2% in 2018), Niger (40.8% in 2018), Mali (43.8% in 2018), Senegal (36.5% in 2017).

Over the period 2012 to 2018, Togo and Mali top the list of countries in terms of the poverty line. Benin is the country with the lowest scores. The other countries are in intermediate positions.

3. Empirical evidence on financial inclusion and poverty

Due to the limited hard data available and the large amount of missing data on financial inclusion, empirical studies exploring the effects and impacts of financial inclusion on macroeconomic variables are relatively limited. Studies examining the link between financial inclusion, poverty and inequality are no exception and present mixed results. Park and Mercado (2015) tested the factors influencing financial inclusion and the importance of financial inclusion in reducing poverty and income inequality based on 37 developing countries in Asia. They found that per capita income, rule of law and demographic structure increased financial inclusion, while the age-dependency ratio significantly reduced financial inclusion. A higher per capita income means that households have sufficient income and a lower risk profile, so they are no longer excluded from the financial system. A better rule of law should increase financial inclusion because it improves the enforcement of contracts, whereas a dependency ratio would reduce it because it means that a large proportion of the population is either young or above retirement age, which hinders access to financial services. Increasing the literacy rate also leads to better access to financial services. In short, financial inclusion reduces both poverty and inequality.

In a more recent version of their paper, Park and Mercado (2018) assessed the impact of financial inclusion on poverty and income inequality for a broader group of countries. Their sample consists of 151 countries divided into high-income, high-middle-income, middle-income and low-income countries. They construct a new financial inclusion index using principal component analysis. Their results indicate that higher financial inclusion co-varies significantly with higher growth and lower poverty rates, but only for high and high-middle income countries and not for middle and low income economies. However, no significant results were found on the effect of financial inclusion on income inequality for any group of countries.

Honohan (2008) studied the effect of financial inclusion on poverty and inequality. His sample is made up of 162 economies. He constructs a composite indicator of financial access using a cross-sectional data set that combines both household survey data and secondary data. The results show that financial access alone significantly reduces poverty, but not when other control variables such as per capita income, private credit, education and health services are included. It also shows that access to financial services significantly reduces income inequality, even when the regressors include financial depth, which measures the share of credit granted to the private sector as a proportion of GDP.

Jabir et al (2017) analysed the effect of financial inclusion on poverty reduction for Sub-Saharan African countries. They use the 2011 Global Findex and select data for 35 sub-Saharan African countries with 10,000 households surveyed per country, i.e. a total of 35,000 households. They use the canonical model of evaluation adapted to the situation in which a treatment may or may not be

administered to an individual. They find that financial inclusion significantly reduces poverty levels in Sub-Saharan Africa by providing greater net wealth and welfare benefits to the poor.

Studies have been carried out in India, mainly to analyse the effects of financial inclusion on inequality. Firstly, Swamy (2014) sets out to examine the importance of the gender dimension of financial inclusion through microfinance in the economic development of poor households in the Indian economy. It attempts to answer the following question; does participation in financial inclusion through microfinance programmes increase women's influence on economic resource mobilisation and their participation in economic decision-making? Previously Burgess and Pande (2005) found that increasing rural bank branches for the benefit of the unbanked reduced rural poverty in India through access to credit and savings services. Similar results were found for Malawi. Indeed, Brune et al (2011) demonstrate that increasing access to financial services by opening savings accounts for poor farmers has a substantial impact on their well-being, as it translates into access to credit to increase their production capacity.

More recently, Erlando et al (2020) have empirically analysed the contribution of financial inclusion to economic growth, inequality and poverty reduction in Eastern India using the Toda-Yamamoto VAR bivariate causality model and the dynamic panel Vector Autoregression (PVAR). The results of the bivariate causality model indicate a high level of relationship between financial inclusion and poverty as well as economic growth. The question of the threshold for financial inclusion to have an effect on macroeconomic performance has been addressed in the context of Sub-Saharan African countries. Nsiah et al (2021) apply the generalised method of moments to annual data for sub-Saharan African countries from 2010 to 2017. They show that financial inclusion only reduces poverty levels above a certain threshold, estimated at 0.365.

García-Herrero and Turégano (2015) assess the role of two dimensions of financial development (size of the financial sector and financial inclusion) in reducing inequality. They find that financial inclusion contributes to reducing inequality when the regression is controlled by macroeconomic variables and fiscal policy. Nevertheless, financial depth measured by the size of the financial system does not contribute significantly to reducing inequality.

Salazar-Cantú, et al (2015) studied the effect of financial inclusion on inequality in income distribution based on regional information in Mexico. Their results indicate that higher financial inclusion would initially lead to greater income inequality, but then reduces inequality significantly as financial inclusion continues to grow within Mexican municipalities.

Although all these studies suggest links between financial inclusion, poverty and income inequality, they do not provide a complete understanding of their relationship due to the small number of studies using panel data and a limited set of variables to construct a financial inclusion index. It is in response to these shortcomings that this research attempts to contribute to the existing literature on analysing the impact of financial inclusion on poverty by focusing on the specific case of WAEMU countries.

4. Analysis of the effects of financial inclusion on poverty in WAEMU countries

In this section, theoretical and econometric models are specified to analyse the crucial factors influencing the level of financial inclusion and the effect of financial inclusion on poverty reduction in WAEMU countries. In addition, it will be a question of constructing a synthetic index of financial inclusion capable of capturing all the dimensions of the phenomenon.

4.1 Econometric model

The explanatory variables used in this study are derived from studies carried out by (Honohan, 2008; Swamy, 2014; Rojas-Suarez & Amado, 2014; Alter & Yontcheva, 2015; Park & Mercado, 2015; Jabir, et al., 2017). To analyse the relationship between financial inclusion and poverty, the following regression is used:

$$POVit = \alpha + \beta 1IFIit + \beta 2GDPit + \beta 3GOUVit + \beta 4INFit + \beta 5OUVit + \beta 6INSTit + \mu it \quad (1)$$

Or POVit measures poverty in country i at date t
IFIit measures financial inclusion in country i at date t
GDPit measures GDP per capita in country i at date t
GOUVit measures government expenditure as a proportion of GDP in country i at date t
OUVit measures trade openness
INSTit measures the quality of governance in country i at date t
INFit measures inflation in country i at date t
μit is the error term
βi is the coefficient of each variable and α is the constant.

Presentation of study variables
Control variables

Under the heading of control variables, a certain number of macroeconomic variables have been selected which, according to the theoretical and empirical literature, have a potential effect on the level of poverty. A brief presentation is given in this section.

Inflation:

Inflation is measured by the increase in the general price level in a country over the course of a year. Inflation harms the poor relatively more than the rich, given that the rich have better access to financial instruments that protect them against inflation and that a larger proportion of their income is indexed to inflation (Easterly & Fischer, 2001).
However, as the authors point out, these arguments are not systematic and the relative effect of inflation on the rich compared with the poor must be specific to the institutions and history of each economy. Its expected effect is therefore ambiguous.

Gross Domestic Product per capita:

Gross domestic product per capita is measured by the ratio of gross domestic product to the total number of inhabitants in a given country. High levels of economic growth (and per capita output as well) are critical to poverty reduction; higher GDP per capita reduces poverty (Dollar & Kraay, 2002). Income growth is one of the most effective poverty reduction strategies.

Government expenditure

Government expenditure is measured here as total government spending in a given year as a proportion of Gross Domestic Product. Above a certain level, government spending is supposed to have a poverty-reducing effect. However, this effect is not systematic, as noted by Omar and Inaba (2020), and a negative relationship is expected between the two variables.

Trade openness

Trade openness is measured by the sum of exports and imports relative to GDP. According to the economic literature, trade openness is essential for reducing poverty, but it must be part of a wider effort. Trade affects the incomes of the poor in different ways: through its effects on economic growth, relative prices, macroeconomic stability and government revenues. The impact of trade on poverty depends on decisions about income distribution (Winters, et al., 2004; Armand, et al., 2020). Trade openness significantly reduces poverty. A negative link is expected between the two variables.

Institutional quality

The analysis of institutions plays a major role in the study of development. Defined in the broadest sense as all the formal and informal rules that structure and coordinate political, economic and social interactions between individuals. They condition economic development and, in turn, poverty reduction. In fact, there is a strong correlation between national indicators of institutional quality and living standards. It is therefore natural to postulate the existence of a causal relationship between institutions and development, with institutional reforms emerging as major instruments of development, especially in the poorest countries. Following the work of Armand et al (2020), the rule of law is used as a proxy for institutional quality. A negative relationship is expected between institutional quality and poverty.

Variable of interest

As the objective of this research is to examine the effect of financial inclusion on poverty, financial inclusion is considered to be a variable of interest. Although a number of indicators, such as the number of bank branches per 1,000 inhabitants, the number of ATMs per 1,000 inhabitants, the number of SME borrowers and the number of accounts in formal institutions, etc., can be applied to assess financial inclusion, the scarcity of data is a major problem. Based on the availability of data, we measure financial inclusion using the three indicators

of access, use and quality adopted by the BCEAO. To avoid the risk of misjudging financial inclusion by using the three dimensions of financial inclusion simultaneously, the BCEAO calculates a synthetic financial inclusion index.

The construction of a new index is inspired by the methodology developed by Sarma (2012) for the reference to an ideal level of financial inclusion and on the other hand by the approach of Camara and Tuesta (2014) for the endogenous determination of the weights associated with the indicators. Based on the financial inclusion indicators monitored by the Central Bank of West African States, three dimensions were selected, namely access, use and affordability. The weight of the indicators and the weights of the dimensions are estimated using a principal component analysis:

The first looks at the indicators for each dimension of financial inclusion, making it possible to estimate their weight, which will then be used to calculate a weighted arithmetic average of these indicators, which will take the place of a sub-index.
The second principal component analysis is carried out with the sub-indices generated in this way to estimate their respective weights.
Thus, considering the three dimensions of financial inclusion, the overall financial inclusion index is as follows:

$$IFI_i = \frac{1}{2}\left(\left(\frac{\sqrt{(a_i^2 + u_i^2 + c_i^2)}}{\sqrt{w_1^2 + w_2^2 + w_3^2}}\right) + \left(1 - \frac{\sqrt{(w_1 - a_i)^2 + (w_2 - u_i)^2 + (w_3 - c_i)^2}}{\sqrt{w_1^2 + w_2^2 + w_3^2}}\right)\right) \quad (\mathbf{1})$$

Where a, u and c represent the sub-indices, (i) the country, (w) the dimension weight.
The coefficient of this variable is expected to have a positive sign.
Financial inclusion is expected to be negatively related to the poverty rate because better access to financial services by low-income people helps to reduce poverty by facilitating consumption and engagement in economically productive activities.

4.2 Estimation techniques

In order to examine the effect of financial inclusion on poverty, we specify the following model, which draws on the work cited above.

$$POVit = \alpha + \beta 1 IFIit + \beta 2 GDPit + \beta 3 GOUVit + \beta 4 INFit + \beta 5 OUVit + \beta 6 INSTit + \mu it \quad (\mathbf{3})$$

The variables are described in the previous section.
Another issue to be addressed concerns the nature of the endogenous variable, i.e. poverty. For some authors, poverty has a dynamic effect, i.e. it is closely linked to its previous value. This dynamic effect is taken into account by introducing the one-period lagged poverty indicator into the explanatory variables. The static model in the equation above is transformed to take this into account. It then becomes:

$$POVit = \alpha + \lambda POV\text{i,t-1} + \beta 1 IFIit + \beta 2 GDPit + \beta 3 GOUVit + \beta 4 INFit + \beta 5 OUVit + \beta 6 INSTit + \mu it (\mathbf{4})$$

The model contains the lagged dependent variable as an explanatory variable. Estimation of this panel data shows the existence of autocorrelation of errors over time due to the lag of the lagged variable and the individual effects characterising heterogeneity. This renders ineffective the use of standard econometric techniques such as ordinary least squares (Nickell, 1981). The individual and temporal dimensions of the data used in this study are small. Moreover, the individual dimension of the data is smaller than the temporal dimension.

Taking into account both this particularity of the data and the multicollinearity problem, the present study adopts the panel-corrected standard error estimator -- PCSE -- to estimate the model. With such data, it is one of the most appropriate estimators for the econometric analysis of the study data, with reference to Beck and Katz (1995). In addition, the PSCE makes it possible to control for the problems of autocorrelation and heteroscedasticity of the errors predicted in the study data.

4.3 Data

The empirical study uses various databases of international institutions over the period 2007 to 2018, depending on the availability of certain data. Data on the quality of institutions measured by the rule of law are taken from the World Bank Institute's Wordwide Governance Indicators (WGI) database. Despite a multitude of sources producing indicators relating to the quality of institutions, there is a lack of robustness in international comparisons based on individual data sources and the difficulty of correctly interpreting inter-country differences.

The data on financial inclusion are taken from the BCEAO's annual reports on the state of financial inclusion. The matrix of other control variables, comprising data on government spending, inflation rate, gross domestic product per capita and trade openness, is taken from the World Bank database (WDI, 2018).

Estimation results and interpretation

Before presenting the results of the econometric estimations of the model, it is important to present the descriptive statistics and the results of the correlation analyses to avoid having to deal with spurious regressions.

Descriptive statistics and correlation analysis

The table shows the descriptive statistics for the different variables.

Table1: Descriptive statistics for the different variables

Variables	Observations	Mean	Standard deviation	Minimum	Maximum
Poverty	96	47,67	8,86	33	69,3
Financial inclusion	96	0,24	0,08	0,12	0,55
GDP per capita	96	1,95	2,44	-6,64	8,01
Trade openness	96	64,28	17,42	35,42	118,10
Inflation	96	2,73	3,01	-2,46	13,82

Variables	Observations	Mean	Standard deviation	Minimum	Maximum
Governmentexpenditures	96	14,96	3,81	7,12	26,04
Quality of governance	96	-0,70	0,37	-1,58	-0,08

Source: Author's calculation based on WDI, 2020; BCEAO, 2019

Over the period (2007 -2018), the poverty line was set at 33% as the minimum value, with a maximum value of 69.3% recorded respectively in 2007 by Benin and in 2010 by Guinea Bissau. As for the variable of interest, the synthetic index of financial inclusion, EU countries achieved an average value of 0.24 over the period in question, with a maximum value of 0.55 and a minimum of 0.12. Gross domestic product per capita averaged 1.95, with a minimum value of -6.64 for Côte d'Ivoire in 2011 and a maximum value of 8.01 for the same country in 2012. Government expenditure as a proportion of GDP averaged 14.96 over the period, with minimum and maximum values of 7.12 and 26.04 respectively. Over the period 2007 to 2018, inflation has been relatively contained, with an average value of 2.76. However, double-digit inflation peaked in Guinea Bissau in 2011 at 13.82%. Institutional quality remains poor for all countries over the period, with an average of -0.7 for a target value of 2.

Correlation analysis between variables shows that some variables are correlated with each other. This is the case, for example, with inflation and financial inclusion, where a negative correlation is noted. The same is true for institutional quality and trade openness, or government spending and trade openness. On the other hand, a positive and significant correlation was noted between gross domestic product per capita and financial inclusion, and between institutional quality and government spending, among others. The results are presented in the appendix.

While correlation analysis links two variables, it does not measure the influence of the explanatory variables on the dependent variable. In addition, the existence of correlation between variables can give rise to problems of multicollinearity which require the use of appropriate econometric methods. For this study, the results of the stationarity test show that some variables are stationary at level and others are stationary at first difference.

5. Results of the Analysis and Discussion

In this section, the results of the econometric estimations are presented, followed by their interpretation. Table 2 presents the results of the estimation of the variables retained for the basic model.

The validation statistics for the model results are satisfactory overall. Theadjusted R2 is at least 50%. The chi2 P-value of the Wald statistic is less than 5%. This indicates that the model is globally exhaustive. The Rho statistic is at least 0.5. The relatively high values of the Rho statistic indicate that the correction for autocorrelation is not negligible in the various estimates made. Taken together, these statistics show that the results are statistically valid.

Table 2 shows that financial inclusion has a negative impact on poverty in the WAEMU zone. The negative and significant relationship between financial inclusion and poverty indicates that an improvement in access to and use of financial services leads to a reduction in poverty, as measured here by the incidence of poverty. The poverty reduction effect noted in this study is consistent with the theoretical work of King and Levine (1993) and Rajan and Zingales (1998). These results, consistent with our predictions above, are in line with the findings of numerous empirical and theoretical studies. These results also support the 2011 Maya Declaration, in which leaders from many economies committed to increasing financial inclusion for those excluded from the financial system through four areas of action: mobile banking, proportionate regulatory frameworks, consumer protection and education, and data collection. Improving financial inclusion strengthens the entrepreneurial capacity of beneficiaries, which increases income and consumption and leads to a reduction in poverty levels. Our results are in line with those of Boukhatem (2016), who concludes that financial development makes an important contribution to poverty reduction and that the instability of the financial system could penalise poor populations and cancel out the positive effects of financial development. Finally, the results corroborate those of other empirical studies such as Asare et al (2020) and Beck et al (2007).

However, this result is not in line with those of Huang and Zhang (2016) for whom financial inclusion has the power to contribute to poverty reduction in the long term. In the short term, the opposite effect is observed, namely that financial inclusion exacerbates household poverty levels.

Government spending and institutional quality are significantly negatively related to the incidence of poverty. In other words, both an increase in government spending and an improvement in institutional quality help to reduce poverty in EU countries. In fact, a one per cent increase in public spending leads to a 0.619 per cent reduction in the incidence of poverty. This confirms the hypothesis postulated above concerning the positive relationship between government spending and poverty reduction.

A one percentage point improvement in institutional quality reduces the level of poverty incidence in the Union by 9.25 per cent according to column (1), ceteris paribus. This result is in line with those of Naceur and Zhang (2016), who conclude that institutional quality enhances macroeconomic stability, respect for the rights of contractors and the regulation of financial institutions, among other things.

Furthermore, it emerges that the incidence of poverty delayed by one period has a significant and positive influence on the endogenous variable, i.e. the incidence of poverty in WAEMU countries. On the other hand, inflation, which reflects the increase in the general price level, GDP and trade openness have a non-significant positive relationship with the incidence of poverty in WAEMU countries. In other words, an increase in the general price level in EU countries translates into an increase in the incidence of poverty. This is because inflation reduces people's income, particularly the purchasing power of the poorest, and also deprives them of access to certain essential goods and services. The poorest households have

both lower incomes and a consumption basket (food, transport, housing, etc.) whose price is rising faster. The natural effect of this is to exacerbate poverty.

Table 2: Estimation results for the study model

Dependante variable:	Incidence of poverty		
Explicatives varaiables	(1)	(2)	(3)
Financial Inclusion	**-30,47*** **	**-1,839**	**-13,84*** **
	(9,057)	(2,010)	(4,867)
GDP per capitat	0,0528	-0,0521	-0,111
	(0,277)	(0,0820)	(0,0836)
Trade Openess	0,0278	0,00279	-0,00460
	(0,0312)	(0,00962)	(0,0300)
Inflation	0,173	0,0198	0,107
	(0,176)	(0,0624)	(0,0676)
Government expenditures gouvernementales	-0,619***	-0,0312	-0,214
	(0,164)	(0,0485)	(0,134)
Quality of governance	-9,252***	-1,260*	-7,730***
	(1,257)	(0,687)	(1,900)
Poverty(lag(1))		0,903***	
		(0,0298)	
Constante	55 ,49***	55,49***	48,88***
	(4,439)	(1,865)	(3,169)
R2 ajusté	0,586	0,9741	0,876
Rhos	--	--	0,799
Statistique de Wald	Prob>chi2=0,00	Prob>chi2=0,00	Prob>chi2=0,00
Observations	96	88	96

Source: Author's calculations using the data presented above.

Notes: The dependent variable is the incidence of poverty. The lagged dependent variable is one of the explanatory variables, given the dynamic nature of the phenomenon. The synthetic financial inclusion index is the variable of interest and the other explanatory variables are control variables. Values in brackets are standard errors. *, **, ***, significance of coefficients at 10%, 5% and 1%.

6. Conclusion and implications

The aim of the study was to analyse the potential effects of financial inclusion on poverty in the countries of the West African Economic and Monetary Union. To empirically verify the relationship between these two variables, an econometric model was formalised and estimated using the PCSE approach.

The results show that financial inclusion has a negative effect on the incidence of poverty in the eight countries of the Union covered by the study. An improvement in financial inclusion helps to reduce the incidence of poverty. Institutional quality and government spending also have a significant negative impact on the incidence of poverty. This means that increasing government spending has a poverty-reducing effect in WEAMU countries. On the other hand, non-significant

relationships are established between the variables Gross Domestic Product, inflation and trade openness and poverty.

The study encourages all measures aimed at improving financial inclusion in the WAEMU. Indeed, this would contribute significantly to reducing the incidence of poverty and increasing people's well-being. In addition, measures to improve institutional quality can be taken in the countries of the Union. Finally, measures to improve institutional quality and government spending are among the economic policy implications of this research.

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Annexes

Table annexe1. Correalation matrix

	POV_{it}	IFI_{it}	GDP_{it}	OUV_{it}	INF_{it}	GOV_{it}	$INST_{it}$
POV_{it}	1						
IFI_{it}	**-0 ,4811***	1					
GDP_{it}	-0,0985	**0,2763***	1				
OUV_{it}	0,1879	0,1754	0,1716	1			
INF_{it}	**0,2665***	**-0,3662***	-0,0298	-0,0483	1		
GOV_{it}	**-0,5733***	0,1401	-0,0270	**-0,3200***	-0,1339	1	
$INST_{it}$	**-0,6837***	**0,3625***	0,1189	**-0,2558***	-0,1728	**0,6148***	1

*Signitificatity at 5 %.

Source : Auteur estimation

Tableau annexe2: Stationarity test

At level Variables	P	Z	L	Décision	In difference Variables	P	Z	L	Decision
POV_{it}	9,1994 (0,9050)	2,5070 (0,9939)	2,5819 (0,9934)	Non Stationnaire	POV_{it}	67,6178 (0,0000)	-2,7071 (0,0034)	-4,1619 (0,0001)	Stationnaire
IFI_{it}	16,5083 (0,4181)	0,0492 (0,5196)	0,0779 (0,5309)	Non Stationnaire	IFI_{it}	92,5645 (0,0000)	-4,2033 (0,0000)	-7,5258 (0,0000)	Stationnaire
PIB_{it}	67,0606 (0,0000)	4,7160 (0,0000)	-6,2589 (0,0000)	Stationnaire	PIB_{it}				
OUV_{it}	22,8436 (0,1180)	1,2234 (0,1106)	-1,2392 (0,1109)	Non Stationnaire	OUV_{it}	67,5906 (0,0000)	-4,3337 (0,0000)	-6,0205 (0,0000)	Stationnaire
INF_{it}	80,9453 (0,0000)	-6,4982 (0,0000)	-7,8905 (0,0000)	Stationnaire	INF_{it}				
GOV_{it}	28,0751 (0,0310)	-1,9838 (0,0236)	-2,0003 (0,0258)	Stationnaire	GOV_{it}				
$INST_{it}$	8,9199 (0,9167)	1,0882 (0,8618)	1,0323 (0,8462)	Non stationnaire	$INST_{it}$	29,8812 (0,018)	-2,2842 (0,0112)	-2.3103 (0,0128)	Stationnaire