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RESEARCH ARTICLE

FINANCIAL INCLUSION AND INCOME INEQUALITY IN WAEMU: THE ROLE OF INSTITUTIONAL QUALITY

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Abstract: The aim of this study is to examine the role of institutional quality in the relationship between financial inclusion and income inequality. The study covers the 8 WAEMU countries over the period 2006-2022. Methodologically, we use traditional conditional mean methods such as FMOLS and DOLS to analyze the long-term relationship between the variables. The results indicate that, in the long term, financial inclusion reduces income inequality. This effect is accentuated when government efficiency is taken into account. Heterogeneity is examined using moment quantile regression (MMQR). The results show that the reducing effect of financial inclusion and of the interaction between financial inclusion and government effectiveness becomes stronger at higher quantiles. The same finding applies to the coefficients of the urbanization variable. The exacerbating effect of the interest rate on loans diminishes in the upper quatiles. In terms of implications, measures aimed at reinforcing financial inclusion policies, and particularly digital inclusion, are desirable. In order to ensure that financial inclusion has a perenial effect in reducing income inequalities, the quality of institutions (government effectiveness) is required.

Keywords: *Financial inclusion, Institutions, Income inequality, UEMOA.*

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INTRODUCTION

Analysis of inequality and poverty shows that in Africa more specifically in Sub-Saharan Africa despite the high growth rates achieved (around 5%) the level of poverty (41 %) and inequality (unweighted Gini 0.43 %) still remain high compared to other regions of the world (UNDP, 2017).

Reducing inequality is an essential way for all economies to cope with potential socio-economic shocks. It remains an imperative in the sense that it guarantees social cohesion, political stability but also the development of human capital (Ofori *et. al.,* 2022). Beyond its impact on social cohesion, rising inequality is detrimental to growth (OECD, 2015). In light of these negative effects of inequality, in September 2015 the General Assembly of the United Nations (UN) sounded the alarm about inequality in all its forms. Thus, among the Sustainable Development Goals (SDGs), goal number 10 is dedicated to reducing inequalities between and within countries. At a global level, several efforts have been made in recent years to reduce inequalities in line with the SDGs. However, these efforts have been wiped out by the Covid 19 pandemic (OECD 2020).

It is important to emphasize that financial inclusion is a key factor in achieving certain objectives of the 2030 Agenda for Sustainable Development (In fact, eight out of seventeen goals make it a target, namely: SDG 1 on the elimination of poverty; SDG 2 on ending hunger, achieving food security and promoting sustainable agriculture; SDG 3 on good health and well-being; SDG 5 on gender equality and women's economic empowerment; SDG 8 on promoting economic growth and employment; SDG 9 on promoting industrialization, innovation and infrastructure; and SDG 10 on reducing inequalities.

Furthermore, SDG 17 on strengthening the means of implementation implicitly foresees that financial inclusion will play a more important role by mobilizing more savings to promote investment and consumption, which drive growth). Moreover, the literature points to financial exclusion as one of the factors explaining income inequality (Burgess and Pande, 2005). Financial inclusion is considered by the World Bank as a situation in which companies and individuals have access to affordable and adapted financial services, enabling them to acquire credit and insurance, carry out financial transactions, make payments and build up savings (World Bank, 2017).

Sub-Saharan African (SSA) countries are characterized by low rates of financial inclusion, which can be attributed to the low state of financial development (Adeleye *et. al.,* 2020). Indeed, the proportion of adult account holders in SSA has increased in recent years, rising from 23.2 % in 2011 to 34.2 % in 2014, and then to around 42.6 % in 2017 (World Bank, 2018). In addition, around 14.9 % of adults save at a financial institution and 25.3 % to save with a savings club or someone outside the family, 8.4 % borrow from a financial institution and 31 % borrow from family or friends (World Bank, 2018). This weak access of populations to credit from financial institutions affects their entrepreneurial activity and thus contributes to the widening income inequalities that exist between rich and poor.

Previous studies analyzing the direct role of financial development on income inequality (Mikek, 2023, Akisik and Gal, 2022, Bittencourt *et. al*., 2019, Destek *et. al.,* 2020 and Nguyen *et. al.,* 2019) have not reached a consensus. This shows that financial inclusion alone is not enough to reduce income inequality. Thus, the quality of institutions can act as a catalyst to improve the impact of financial development on income inequality.

While this literature exists, it is important to stress that it is limited (Ouechtati, 2022). This study thus contributes to the economic literature by attempting to fill this gap and by taking into account the heterogeneity that could exist between individuals. It applies to UEMOA countries due to their high level of inequality (Gini index 53.472 on average between 2006 and 2022) and an improvement in financial inclusion (BCEAO, 2023). This study therefore aims to investigate the interaction effect of financial inclusion and institutional quality on income inequality.

LITERATURE REVIEW

Financial Inclusion and Income Inequality

The relationship between financial inclusion and income inequality is well established in the economic literature. Early studies (Aghion and Bolton, 1992; Banerjee and Newman, 1993; Durlauf, 1996; Galor and Zeira, 1993; Piketty, 1997), point to credit market imperfections as the main source of persistent income inequality. Indeed, financial market imperfections, such as information asymmetries and transaction costs, prevent the poor from escaping poverty by limiting their Access to formal financial products and services. Financial inclusion can influence income inequality directly or indirectly.

With access to financial products and services, the poor can save or borrow money to invest in training or in the creation of income-generating activities (direct effect). In this case, the impact of financial inclusion on inequality may be weak, as it contributes in the short term to an immediate increase in the income of those who benefit from it. The indirect effect occurs when poor people take advantage of their access to finance to invest in education and training to improve their chances of getting a decent job or becoming an entrepreneur, thus breaking the cycle of poverty.

Empirically, Kling *et. al.* (2020) found, based on Chinese data from 2011 to 2013, that income inequality worsened if households used formal or informal loans, while access to bank accounts improved households' prospects for future income distribution. Park and Mercado (2018), for their part, find that increasing the accessibility, availability and use of financial services, measured respectively by the number of ATMs and commercial bank branches per 100,000 adults, the number of borrowers and depositors with commercial banks per 1,000 adults and the household credit/GDP ratio, reduces income inequality. Quoc *et. al.* (2019) use the double ordinary least squares method on panel data from 22 transition economies and find that the financial inclusion index

contributes to reducing income inequality. Using the same method, Turégano and Herrero (2018) carry out a comparative study of the effect of financial deepening and financial inclusion on income inequality on an unbalanced panel of nearly 75 countries over the period 2000-2011. They find that the composite financial inclusion index reduces income inequality, while financial deepening has no impact on inequality.

In sub-Saharan Africa, works by Esther (2019), Bkwayep and Tsafack (2020), and Ngono (2020) have analyzed the impact of several aspects of financial inclusion on income inequality. Esther's (2019) study uses panel data and the system GMM method to analyze the effect of financial inclusion on income inequality in sub-Saharan Africa. The results reveal that financial inclusion contributes to reducing income inequality and that its ability to reduce is strongly conditioned by the financial inclusion of poor households and more specifically by bank branch penetration and the use of financial services.

Bkwayep and Tsafack (2020) analyze whether migrant remittances can, through financial inclusion, contribute to reducing income inequality in sub-Saharan Africa. Results obtained using the GMM method on a panel of 47 sub-Saharan African countries revealed a positive interaction between migrant remittances and financial inclusion that contributes to reducing income inequality. Ngono (2020) finds the same result.

Institutions and Income Inequality

Institutions, as the implicit and explicit rules by which members of a society interact, shape the economic behavior of agents and help explain the economic performance of countries. When these rules are constantly changing or not respected, when government discretion is unlimited, when property rights are not well secured, or when corruption is high and enforcement weak, there is likely to be an institutional quality problem, since service provision, resource allocation and fairness of judgments will be less than desirable, and actual achievements will be less than desired.

Problems related to institutional quality can result in an increased degree of uncertainty that sends conflicting signals to the market, affecting the production and distribution process. Based on a panel of 143 countries between 1996 and 2015 and using the FE-IV technique, Vu (2022) manages to show that political instability reduces income redistribution.

Similarly, Bahamonde and Trasberg (2021) use two-stage least squares and the GMM approach on a panel of 126 industrial and developing economies to find that democratic government exerts a reducing effect on income inequality. This result is similar to that obtained by Adams and Akobeng (2021) on a sample of 46 African countries between 1948 and 2018. Chia et al. (2022) use the Vector Autoregressive Model (PVAR) on a panel of 68 developing countries from 2000 to 2016 to show that transparency has no significant effect on income inequality.

However, a number of studies have shown that institutions exacerbate income inequality. Saha et al (2021) use the method of generalized moments in first difference to show that corruption increases inequality over a sample of 21 Asian economies between 1995 and 2015, Keneck-Massil et al (2021) deploy a sequential linear estimator of panel data to conclude that corruption contributes to rising income inequality over a study of 172 countries from 1975 to 2017.

Similarly, Chambers and O'Reilly (2021) use the indexed effects approach to reveal that regulations increase inequality in the US from 1997 to 2015. Kammas and Sarantides (2019) use several analytical methods on a sample of 174 countries from 1960 to 2013 to reveal that dictatorial regimes worsen income distribution. As for Meniago and Asongu (2018), they use GMMs to establish that political instability increases income inequality based on a sample of 48 sub-Saharan African countries between 1996 and 2014.

The lack of consensus led Asamoah (2021) to explore the potential existence of threshold effects. To do so, they mobilize the dynamic threshold panel model developed by Kremer et al. (2013) on a sample of developing and advanced countries from 1995 to 2017. The author obtains two types of results: (i) when institutional quality is measured by global governance indicators, a quadratic effect is found for advanced countries, but a monotonic negative effect is found for

developing countries; (ii) when the measure of institutional quality based on the International Country Risk Guide is used as the threshold variable, he finds an inverted Kuznets U-shaped relationship between institutions and income inequality, for both advanced and developing countries.

This literature shows that it is difficult to accurately predict the relationship between financial inclusion, institutional quality and income inequality. Results vary according to the methods used and the measures employed. For our purposes, we follow Ouechtati (2022), who suggests that institutional quality may mitigate the effect of financial inclusion on income inequality.

While this literature exists, it is important to emphasize that it is limited. This study thus contributes to the economic literature by attempting to fill this gap and by taking into account the heterogeneity that could exist between individuals.

METHODOLOGY

Model Specification

The relationship between financial inclusion and institutional quality could highlight heterogeneities due to the level achieved by financial inclusion and the effectiveness of each government. To investigate heterogeneous and distributive impacts across quantiles, the present study uses the MMQR model designed by Machado and Silva (2019). Conventional panel quantile regression techniques (Koenker, 2004; Canay, 2011), can provide reliable estimates in the presence of outliers and are appropriate in a situation where the conditional means of two variables have a weak association.

By allowing for the individual fixed effect, the MMQR method examines the impact of the conditional heterogeneous covariance of the determinants of income inequality on the whole distribution. In addition, rather than shifting averages as Koenker (2004), Canay (2011) do, it captures the effect of covariance in the overall distribution. The advantage of this method is that it takes into account the conceivable presence of endogenous properties in the explanatory variables. This technique is also appropriate in situations where individual effects are ubiquitous in the panel data model.

Although fixed effects cannot account for heterogeneity, the application of the MMQR method covers this issue due to its ability to produce heterogeneous estimates across the distribution. Performing an error analysis Machado and Silva (2019) have shown, using simulation results, that the MMQR method provides more robust estimates than conventional models. Other panel regression methods, such as FMOLS and DOLS, have the advantage of dealing with serious correlations and endogeneity, but they do not provide estimates based on data conditions.

As far as non-linearity is concerned, the MMQR model also produces reliable estimates. Compared with nonlinear models such as the "Nonlinear Autoregressive Distributed Lag" NARDL, the advantage of using MMQR is that it defines the threshold through a data-driven process and not exogenously (Shin *et al.,* 2014).

In addition, MMQR allows for location-based asymmetries. Consequently, the method is preferred because it addresses heterogeneity and endogeneity by considering the asymmetric and non-linear association between income inequality and its determinants.Estimates of the conditional quantile Q(τ|X) of the location scale variant model can be expressed with the following equation:

$$y_{it} = \alpha_i + X_{it}\beta + \left(\delta_i + Z_{it}\gamma\right)U_{it} \qquad (1)$$

Where, probability $P\left\{\delta_i + Z_{it}\gamma > 0\right\} = 1$, $\left(\alpha, \beta, \delta, \gamma\right)$ are the parameters to be estimated. The fixed effects of individual i are denoted by $\left(\alpha_i, \delta_i\right)$, $i = 1, \ldots, n$ and k vector of known elements of X is given by Z, which are differentiable conversions with the l component mentioned below :

$$Z_l = Z_l\left(X\right) \;\; l = 1, \ldots, k \qquad (2)$$

Xit is independently and identically distributed for any fixed i and also across time t. Uit is also independently and identically distributed among individuals i across time t and are orthogonal to Xit and are standardized to respect the moment conditions. Equation (1) yields the following:

$$Q_y = (\tau | X) = (\alpha_i + \delta_i(\tau)) + X_{it}\beta + Z_{it}\gamma q(\tau) \quad (3)$$

Where, Xit stands for the vector of independent variables including the overall rate of access to financial services (Acces), government effectiveness (Gouveff) which captures institutional quality. By definition, government effectiveness reflects perceptions of the quality of public services, the quality of the civil service and its degree of independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to these policies.

Thus, the effectiveness of redistribution policies would depend on this perception. For these reasons, we have chosen this variable as the institutional variable. In the explanatory variables, we introduce an interaction between financial inclusion and government effectiveness. The other explanatory variables are government public spending (Govspend), trade openness (Open), loan interest rate (interest), GDP growth rate (GDP) and urbanization (Urban).

Q(τ|X) postulates that structural quantiles are distributed to the explained variable yit (income inequality (Gini index) as a function of the distribution (location) of exogenous variables X. Fixed effects of the individual quantile (i) (τ) are demonstrated by the scalar coefficient denoted:

$$\alpha_i(\tau) = \alpha_i + \delta_i(\tau). \quad (4)$$

The constant does not represent the individual effect, unlike typical fixed least-squares effects. These parameters are time-invariant with heterogeneous effects that may diverge along the conditional distribution quantiles of the endogenous variable. The quantile τ of the sample represented by q(τ) can be evaluated by addressing the resulting optimization problem written in equation (4).

$$\min_q \sum_i \sum_l \rho_\tau \left(R_{it} - (\delta_i + Z_{it}\gamma) q\right) \quad (5)$$

Où, $\rho_\tau(A) = (\tau - 1) AI\{A \le 0\} TAI\{A > 0\}$

Data

For the empirical analysis we use data from the 8 countries of the West African Economic and Monetary Union over the period 2006 to 2022. Table 1 summarizes the variables studied, their sources and measures.

Table 1: Summary of variables

Variables	Definition	Measurement	Source
Gini	Gini index	The index is measured using the Lorenz curve	WDI
Acces	Overall rate of access to financial services	Measured by the number of financial institutions per square kilometer	BCEAO
Gouveff	Government efficiency	Obtained by aggregating survey data on good governance	WGI
GDP	GDP growth rate	Relative variation in GDP	WDI
Govspend	Public expenditure	Relative variation in consumption expenditure by public authorities	WDI
Open	Degree of openness	Average trade/GDP ratio	WDI
Interest	Interest rates on loans	Average lending rates	BCEAO
Urban	Urbanization rate	Urban population as a percentage of total population	WDI

The choice of study period is linked to data availability. Apart from the interest rate on loans and access to financial services, which come from the BCEAO database, the other variables come from the World Bank.

Table 2: Descriptive statistics for variables

Variables	Mean	Std. Dev.	Min	Max	Obs
Gini	53,472	4,974	35,795	62,190	136
Acces	179,272	381,055	0,170	2930,997	136

Gouveff	-0,685	0,674	-2,479	0,548	136
GDP	4,541	2,512	-5,370	10,760	136
Govspend	6,459	13,087	-26,631	88,763	136
Open	28,404	7,125	16,890	56,381	136
Interest	5,216	0,458	4,737	6,934	136
Urban	37,966	10,572	16,208	52,644	136

WAEMU countries remain unequal, with an average Gini index of 0.5347 for a scale of one. The standard deviation of the Acces variable reveals a certain heterogeneity in financial inclusion between the countries of the union. This can be seen in government action, particularly public spending.

RESULTS AND DISCUSSION

Results of Unit Root and Cointegration Tests

The choice of unit root tets in panel data requires prior performance of the inter-individual independence test. In our case, the Breusch-Pagan test was performed. The probability of the LM test (chi2(28) = 82.155, Pr = 0.0000) suggests that we should opt for second-generation unit root tests. In essence, the Pesaran (2007) test was performed.

Table 3: Unit root test results

	Pesaran (2007)			
	Level		First différence	
Variable	Zt-bar	Pvalue	Zt-bar	Pvalue
Gini	-3,121***	0,001		
Acces	-4,219 ***	0,000		
Gouveff	-1,355*	0,088		
GDP	-2,417***	0,008		
Govspend	-5,371***	0,000		
Open	0,715	0,763	-4,551***	0,000
Interest	1,365	0,914	-9,157***	0,000
Urban	-0,922	0,178	-5,931***	0,000

Note: the sign (*) indicates the level of significance, (*) at 10%, (**) at 5% and (***) at 1%.

The results in Table 3 show that not all variables are stationary in level. The existence of stationary variables in first difference (TxLoans and Urban) suggests the existence of long-term relationships between the variables in the study.

Table 4: Results of the cointegration test

	Statistic	p-value
Modified Phillips-Perron t	4.4983	0.0000
Phillips-Perron t	-3.0257	0.0012
Augmented Dickey-Fuller t	-1.3417	0.0899

Note: (H0): No cointegration; (Ha): at least one of the cross-sectional units shows cointegration.

The result of Pedroni's test reveals the existence of a cointegrating relationship, i.e. the variables maintain a long-term relationship.

Results of Conditional Mean Models

This result shows that financial inclusion reduces income inequality. Indeed, the access variable has a significant coefficient at the 1% threshold, and has a negative influence on income inequality. This effect is accentuated when government efficiency is taken into account.

Table 5: FMOLS and DOLS results

	FMOLS	DOLS

	Coef,	Std, Err,	Pvalue	Coef,	Std, Err,	Pvalue
Acces	-0,002***	0,000	0,000	-0,005***	0,002	0,001
Gouveff	4,036***	0,314	0,000	3,639***	1,119	0,001
accesgeo_gouveff	-0,008***	0,001	0,000	-0,006*	0,004	0,071
GDP	-0,032	0,021	0,133	0,073	0,162	0,655
Govspend	0,076***	0,010	0,000	0,006	0,028	0,834
Open	-0,092***	0,013	0,000	0,103	0,081	0,203
Interest	1,422***	0,262	0,000	2,520**	1,192	0,034
Urban	0,263**	0,069	0,000	0,283	0,282	0,316

Note: the sign (*) indicates the level of significance, (*) at 10%, (**) at 5% and (***) at 1%.

Trade openness has a significant coefficient at the 1% level and negatively influences income inequality in the long term. This implies that trade openness reduces income inequality in the WAEMU.

Urbanization, public spending and resource costs increase long-term income disparities. Indeed, these variables have significant coefficients at the 1% level and positively influence the Gini index.

Results using the Regression method of Quantiles by Moments

The results of the quantile-by-moments method are repeated. The coefficients for access to financial services are significant at the 1% level and negatively influence the Gini index in all quantiles. The value of the coefficient varies from -0.0023 in the 10th quantile to -0.0010 in the 90th quantile. This suggests that financial inclusion leads to a reduction in income inequality.

Indeed, by having access to financial products and services, the poor can save or borrow money to invest in their training or in the creation of income-generating activities. When the poor take advantage of their access to finance to invest in education and training, they stand a better chance of getting a decent job or becoming an entrepreneur, thus breaking the cycle of poverty. The result is in line with those of Bkwayep and Tsafack (2020).

The interaction between access to financial services and government efficiency shows a positive coefficient, statistically significant at the 1% level in all quantiles. The value ranges from -0.01 at the 10th quantile to -0.0059 at the 90th quantile.

As in the predictions of Ouechtati (2022), institutional quality is a good channel for reducing income inequality. In contrast, government efficiency positively influences the Gini index in all quantiles.

This counter-intuitive result could be due to the shift from poor-quality to good-quality institutions. Trade openness, economic growth rate and public spending have insignificant coefficients. The lack of effect of economic growth on income inequality stems from the fact that economic growth is not inclusive in the countries of the union.

Furthermore, the lack of effect of public spending is due to the structure of expenditure, which is mainly made up of operating expenses.

Urbanization is also a factor in reducing income inequality in the WAEMU. Urbanization can help reduce national inequality by narrowing the gap between urban and rural areas. According to Maket et al (2023), urbanization reduces pressure on rural resources and increases the land/labor ratio.

This in turn increases rural per capita income. When interest rates on loans rise, income inequality increases. Interest rates are an instrument of capitalism, concentrating the accumulation of wealth in the hands of a very small number of people, and thus exacerbating inequalities.

In addition, transaction costs prevent the poor from escaping poverty by limiting their access to formal financial products and services.

Table 6: Results of quantile moment regressions

	Gini	Coef,	P>|z|		Gini	Coef,	P>|z|
location	Acces	-0,002**	0,031	qtile_25	Acces	-0,002**	0,021
	Gouveff	2,300***	0,000		Gouveff	2,712***	0,000
	accesgeo_gouveff	-0,008***	0,000		accesgeo_gouveff	-0,010***	0,000
	GDP	-0,023	0,792		GDP	-0,005	0,957
	Govspend	-0,014	0,519		Govspend	-0,022	0,372
	Open	-0,016	0,674		Open	0,003	0,953
	Interest	3,416***	0,000		Interest	3,595***	0,000
	Urban	-0,965***	0,000		Urban	-1,010***	0,000
	_cons	73,889***	0,000		_cons	72,827***	0,000
scale	Acces	0,000	0,333	qtile_30	Acces	-0,002**	0,021
	Gouveff	-0,445	0,190		Gouveff	2,653***	0,000
	accesgeo_gouveff	0,001	0,117		accesgeo_gouveff	-0,009***	0,000
	GDP	-0,019	0,690		GDP	-0,008	0,935
	Govspend	0,009	0,455		Govspend	-0,020	0,384
	Open	-0,020	0,333		Open	0,000	0,997
	Interest	-0,193	0,503		Interest	3,569***	0,000
	Urban	0,049	0,501		Urban	-1,003***	0,000
	_cons	1,145	0,633		_cons	72,981***	0,000
qtile_10	Acces	-0,002**	0,026	qtile_40	Acces	-0,002**	0,022
	Gouveff	2,936***	0,000		Gouveff	2,500***	0,000
	accesgeo_gouveff	-0,010***	0,000		accesgeo_gouveff	-0,009***	0,000
	GDP	0,004	0,971		GDP	-0,015	0,874
	Govspend	-0,026	0,346		Govspend	-0,017	0,428
	Open	0,013	0,799		Open	-0,007	0,861
	Interest	3,692***	0,000		Interest	3,503***	0,000
	Urban	-1,034***	0,000		Urban	-0,987***	0,000
	_cons	72,251***	0,000		_cons	73,372***	0,000

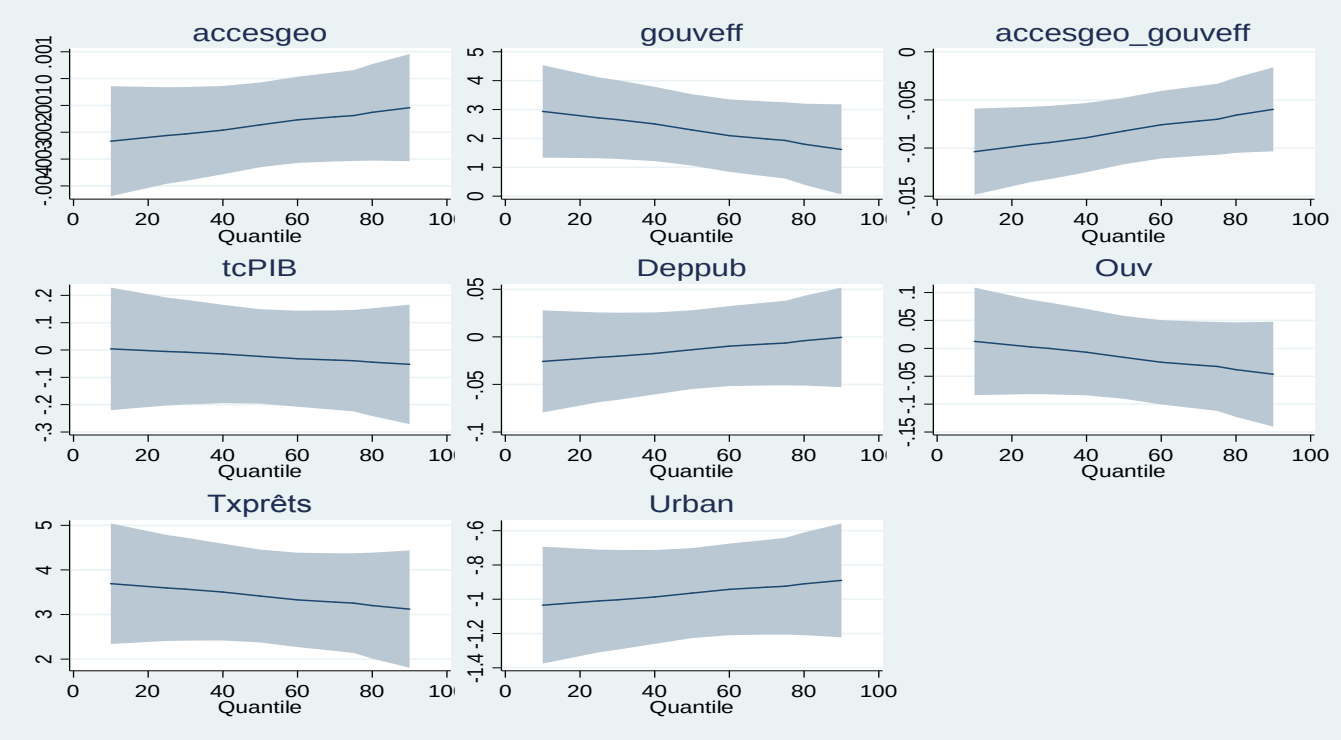
Note: the sign (*) indicates the level of significance, (*) at 10%, (**) at 5% and (***) at 1%.

	Gini	Coef,	P>|z|		Gini	Coef,	P>|z|
qtile_50	Acces	-0,002**	0,032	qtile_75	Acces	-0,001	0,111
	Gouveff	2,294***	0,000		Gouveff	1,929***	0,004
	accesgeo_gouveff	-0,008***	0,000		accesgeo_gouveff	-0,007***	0,000
	GDP	-0,023	0,790		GDP	-0,039	0,680
	Govspend	-0,013	0,524		Govspend	-0,006	0,776
	Open	-0,016	0,670		Open	-0,032	0,425
	Interest	3,413***	0,000		Interest	3,256***	0,000
	Urban	-0,964***	0,000		Urban	-0,924***	0,000
	_cons	73,904***	0,000		_cons	74,843***	0,000
qtile_60	Acces	-0,002*	0,061	qtile_80	Acces	-0,001	0,172
	Gouveff	2,097***	0,001		Gouveff	1,801**	0,012
	accesgeo_gouveff	-0,008***	0,000		accesgeo_gouveff	-0,007***	0,001
	GDP	-0,032	0,722		GDP	-0,045	0,658
	Govspend	-0,010	0,652		Govspend	-0,004	0,868
	Open	-0,025	0,518		Open	-0,038	0,377
	Interest	3,328***	0,000		Interest	3,200***	0,000
	Urban	-0,942***	0,000		Urban	-0,910***	0,000
	_cons	74,410***	0,000		_cons	75,173***	0,000
qtile_70	Acces	-0,001*	0,092	qtile_90	Acces	-0,001	0,288
	Gouveff	1,981***	0,003		Gouveff	1,619**	0,042
	accesgeo_gouveff	-0,007***	0,000		accesgeo_gouveff	-0,006***	0,007
	GDP	-0,037	0,691		GDP	-0,052	0,638
	Govspend	-0,007	0,737		Govspend	-0,001	0,985
	Open	-0,030	0,450		Open	-0,046	0,334

	Interest	3,278***	0,000		Interest	3,121***	0,000
	Urban	-0,930***	0,000		Urban	-0,890***	0,000
	_cons	74,708***	0,000		_cons	75,641***	0,000

Note: the sign (*) indicates the level of significance, (*) at 10%, (**) at 5% and (***) at 1%.

The examination of the coefficients (graph1) reveals that the reducing effect of financial inclusion and of the interaction between financial inclusion and government efficiency is reinforced in the higher quantiles. The same applies to the coefficients of the urbanization variable. The exacerbating effect of the interest rate on loans fades in the upper quatiles.



Graph1 : Coefficient of quantile-by-moment regression

CONCLUSION

The aim of this study is to examine the role of institutional quality in the relationship between financial inclusion and income inequality. The study covers the 8 WAEMU countries over the period 2006-2022. Methodologically, we use traditional conditional mean methods such as FMOLS and DOLS to analyze the long-term relationship between the variables. The results indicate that, in the long term, financial inclusion reduces income inequality. This effect is accentuated when government efficiency is taken into account.

Heterogeneity is examined using moment quantile regression (MMQR). The results reveal that the coefficients on access to financial services are significant at the 1% level and negatively influence the Gini index in all quantiles.

The value of the coefficient varies from -0.0023 in the 10th quantile to -0.0010 in the 90th quantile. This suggests that financial inclusion leads to a reduction in income inequality. The interaction between access to financial services and government efficiency displays a positive and statistically significant coefficient at the 1% threshold in all quantiles. The value ranges from -0.01 at the 10th quantile to -0.0059 at the 90th quantile. As in Ouechtati's (2022) forecast, institutional quality is a good channel for reducing income inequality. Urbanization is a factor in reducing income inequality in the WAEMU. When lending rates rise, so does income inequality.

The reducing effect of financial inclusion and the interaction between financial inclusion and government effectiveness is reinforced in the higher quantiles. The same applies to the coefficients of the urbanization variable. The exacerbating effect of the interest rate on loans fades in the upper quatiles. In terms of implications, measures aimed at strengthening

financial inclusion policies, and particularly digital inclusion, are desirable. In order to leverage the effects of financial inclusion in reducing income inequality, the quality of institutions (government efficiency) is required. Union authorities can take advantage of urbanization by migrating towards the smart city concept.

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