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Monetary policy transmission mechanisms and financial inclusion in West Africa countries

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Abstract. The purpose of the study was to examine the influence of monetary policy on financial inclusion in sixteen West African countries using panel data from the International Monetary Fund database covering 2010-2021. Financial inclusion was measured through a composite index generated via principal component analysis, incorporating indicators of financial institution penetration, availability, and usage. As a result, the following indicators were determined: money supply (MS, $\beta = 2.948901$, $p < 0.01$), open market operations (OMO, $\beta = 0.011170$, $p < 0.01$), liquidity ratio (LIQR, $\beta = 1.591667$, $p < 0.01$), reserve money (RM, $\beta = 0.800120$, $p = 0.012$), and monetary policy rate (MPR, $\beta = 0.040445$, $p < 0.01$). Cash reserve ratio (CRR, $\beta = -0.18154$, $p = 0.637$) and inflation (INF, $\beta = -0.001634$, $p = 0.914$) were not statistically significant. The model explained about 68% of the variation in financial inclusion ($R^2 = 0.6834$). The findings revealed that money supply significantly and positively influenced financial inclusion, showing that liquidity expansion increased banks' lending capacity and supported wider outreach. Open market operations also had a strong positive effect, as effective liquidity management fosters stability and encourages greater access to financial services. The bank liquidity ratio positively impacted inclusion by strengthening depositor confidence and enhancing banks' resilience. Reserve money and monetary policy contributed positively and significantly to enhancing financial inclusion. The cash reserve ratio, and inflation showed no significant impact, suggesting that their influence was indirect or constrained by structural financial limitations in the region. The study concluded that liquidity-enhancing monetary policies were critical for improving financial inclusion in West Africa. It was recommended expanding money supply, strengthening open market operations, enforcing robust bank liquidity ratios, and adopting cautious interest rate policies, supported by digital financial services and financial literacy initiatives

Keywords: cash reserve ratio; open market operations; liquidity ratio; money supply; reserve money

Introduction

Financial inclusion in West Africa had grown, motivated by the growth of mobile and digital banking services. The introduction and rapid adoption of mobile money platforms had enabled millions of individuals was left out of the structured financial system in order to obtain essential financial services such as payments, savings, and credit. A. Khan *et al.* (2023) explained that development had positioned West Africa as a leading region in the global mobile money landscape, with the continent as a whole accounting for nearly half of mobile banking services worldwide. Nevertheless, according to World Bank Group (n.d.b) progress remained uneven. While

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countries such as Kenya and Ghana had recorded remarkable advances, others, including Niger and Guinea, still exhibit low account ownership rates of 14% and 23% respectively. Across the West African Economic and Monetary Union region, only 41% of adults own a mobile money account or a bank account, leaving an estimated 130 million adults without formal access to finance.

M.U. Arshad *et al.* (2021) pointed that the interaction between financial inclusion and monetary policy was increasingly recognised as central to bridging these gaps. Monetary policy had a significant impact on improving financial inclusion by influencing the cost, availability, and accessibility of financial services. R. Kumar (2022) mentioned that monetary policy instruments including the monetary policy rate, cash reserve ratio (CRR), liquidity ratio, and open market operations (OMO) directly influenced credit availability, lending behaviour, and access to financial services. For instance, D.W. Adams (2022) identified that high policy rates may incentivise bank expansion but simultaneously raised the cost of borrowing, discouraging low-income participation in formal credit markets. K. Iddrisu *et al.* (2025) noted that stringent liquidity and reserve requirements constrained banks' lending capacity, disproportionately affecting small businesses and rural households already at the margins of the financial system. Moreover, Y. Alhassan *et al.* (2025) argued that OMOs were frequently targeted at large commercial banks, while excluding microfinance institutions and fintech providers that were closest to financially excluded groups.

The effectiveness of monetary policy in promoting financial inclusion depended not only on its design but also on the strength of its transmission mechanisms, which remained weak across much of West Africa due to underdeveloped financial infrastructure. According to A.R. Olajide *et al.* (2022), rising policy rates, as evidenced by the collapse of several U.S. banks during the 2023 banking crisis, underscored the risks of poorly calibrated policies that undermined both financial stability and inclusion. R. Kumar & D.C. Pathak (2022) argued that, when policy rates were used as benchmarks for pricing, the banks raised the price of financial services, reduced credit demand, and narrowed the pool of beneficiaries. This dual effect reduced both the supply and demand for financial services, further excluding vulnerable groups. While central banks in West Africa focused on inflation control and price stability, the broader implications of monetary policy for inclusive finance required urgent attention. Aligning monetary policy with financial inclusion goals was crucial for equitable economic growth and poverty reduction. However, studies analysing the link between monetary policy mechanisms, particularly reserve money and policy rates, and financial inclusion in West Africa were scarce. E.J. Tonuchi *et al*. (2021) investigated the connection between monetary policy and financial inclusion in West Africa, but considered financial inclusion as an independent variable influencing inflation, interest rate transmission, and financial development. The purpose of study was to analyse financial inclusion as a dependent variable, providing empirical insights for academics, policymakers, and regulators, offering practical guidance on structuring monetary policies to promote inclusive economic growth.

Literature Review

International Monetary Fund (n.d.) defined monetary policy as the method, by which a country's central bank or monetary authority regulated the money supply, frequently focusing on interest rates to maintain stability of prices and confidence in the currency. I.T. Aliu (2022) mentioned that monetary policy involved government measures to influence the monetary sector, with most authorities seeking to control money supply growth to curb inflation and support economic activity. While objectives differed across countries, it generally revolved around price stability and broader macroeconomic goals, with central banks like the Central Bank of Nigeria using money supply control as a key tool. According to V. Marhasova *et al.* (2020), monetary policy instruments varied across countries depending on the level of economic and financial sector development, but commonly included reserve requirements, open market activities, and changes in interest rates, central bank lending, direct credit controls, moral suasion, exchange rate policy, and prudential guidelines. M. Basheer *et al.* (2022) argued that reserve requirements oblige banks must retain a portion of their funds as cash or with the central bank, thereby influencing their lending capacity. According to A. Altunyan *et al.* (2020), open market operations involved the purchasing or selling of treasury bills and other securities to regulate bank reserves and money supply, while central bank lending, often through the monetary policy rate (MPR), affects credit availability, savings, and investment, thereby shaping economic growth. Other instruments included direct credit controls, which set loan ceilings, sectoral allocations, or interest rate caps to guide investment moral suasion, where regulators persuaded banks to align credit and savings policies with national objectives. Collectively, these instruments allowed central banks to influence credit, investment, and economic activity, finding a balance between growth and financial stability.

P.K. Ozili (2020) opined that many countries had made financial access a major policy priority. When well designed, such efforts can reduce poverty, stimulate entrepreneurship, and foster shared prosperity, but when poorly structured they may expose vulnerable groups to risks such as over-indebtedness, thereby worsening inequality. According to O. Adeola & O. Evans (2017), in Africa, particularly in Nigeria, expanding financial access was viewed as a pathway to economic diversification, poverty reduction, and improved living standards. Despite its recognised importance, financial inclusion continued to be limited by a variety of

institutional, structural, demand-related, and educational obstacles. K. Mutsonziwa & A. Fanta (2019) noted that weak financial infrastructure, limited branch networks, poor regulation, and low contract enforceability leave large groups excluded. P. Khera *et al.* (2022) mentioned that institutional factors such as unemployment, low income, absence of identification, restrictive credit-scoring systems, and stringent capital requirements further limit outreach, while financial firms often perceived small or remote markets as unprofitable. Measuring the extent of inclusion had therefore become central to policy debates. While early frameworks focused mainly on deposits, loans, and payments, later studies emphasised multidimensional indicators combining access, usage, and penetration approaches. By including mobile accounts, transactions, and agent outlets as a separate dimension, these approaches provided a more comprehensive picture of evolving financial landscapes and align more closely with current policy priorities.

Materials and Methods

The study examined data from 2010 to 2021, identifying three key shifts in the relationship between monetary policy and financial inclusion in West Africa. The first shift in 2014-2015 followed the oil price crash, leading to economic instability. In response, monetary authorities adjusted interest rates, reserve ratios, and liquidity policies, prompting banks to focus on digital and retail banking. The second shift in 2016-2017 was driven by regulatory reforms and Central Bank of West African States (n.d.) promotion of digital finance, which expanded mobile money and digital banking, enhancing the impact of liquidity tools on financial inclusion. The third shift in 2020 was triggered by the COVID-19 pandemic, which accelerated digital payments through accommodative policies. World Bank Group (n.d.a; n.d.b), and International Monetary Fund (n.d.) data of 16 West African countries (Benin, Burkina Faso, Cabo Verde, Côte d'Ivoire, Gambia, Mauritania, Ghana, Guinea, Niger, Togo, Guinea-Bissau, Liberia, Mali, Nigeria, Senegal, and Sierra Leone) were analysed using an ex post facto research design. The study adapted and modified the model of E.B. Anarfo *et al.* (2019). The model was stated as:

$$FINC_{it} = \beta_0 + \beta_1 CRR_{it} + \beta_2 M2_{it} + \beta_3 OMO_{it} + \beta_4 LQR_{it} + \mu_{it}, \quad (1)$$

where, FINC – financial inclusion, CRR – cash reserve ratio, M2 – broad money supply, OMO – open market operation, LQR – liquidity ratio, μ_{it} – random error term, apriori expectation, $\beta_1 < 0$, $\beta_2 > 0$, $\beta_3 > 0$, $\beta_4 > 0$ – estimation criteria.

Reserve money (RM), monetary policy rate (MPR) were added to strengthen the explanatory representation including inflation (INF) as a macroeconomic control. Here were the model's specifications:

$$FINC_{it} = \beta_0 + \beta_1 CRR_{it} + \beta_2 M2_{it} + \beta_3 OMO_{it} + \\ + \beta_4 LQR_{it} + \beta_5 RM_{it} + \beta_6 MPR_{it} + \beta_7 INF_{it} + \mu_{it}, \quad (2)$$

where, FINC – financial inclusion, CRR – cash reserve ratio, M2 – broad money supply, OMO – open market operation, LQR – liquidity ratio, μ_{it} – random error term, apriori expectation, RM – reserve money, MPR – monetary policy rate, INF – inflation, $\beta_1 < 0$, $\beta_2 > 0$, $\beta_3 > 0$, $\beta_4 > 0$, $\beta_5 > 0$, $\beta_6 < 0$, $\beta_7 < 0$ – estimation criteria.

This study adopted principal component analysis (PCA), which was also conducted to determine an index for financial inclusion. For regression analysis, R-squared, F-statistic, t-test were useful for model estimation. R_2 was a measure of the regression analysis's overall explanatory power. The model's overall significance was assessed using the F-statistic, and the t-test assessed the overall statistical significance of the model. The study applied statistical methods that were both descriptive and inferential. Descriptive statistics (mean, standard deviation, minimum, and maximum) summarised the data, while variance inflation factor (VIF) tested for multicollinearity and pairwise correlation assessed relationships between variables. A composite financial inclusion index was constructed using PCA, which consolidated multiple indicators such as access to banking, digital usage, and credit penetration into a single unbiased measure (Kherif & Latypova, 2020). For inferential analysis, the effects of monetary policy channels; cash reserve ratio, open market operations, liquidity ratio, money supply, reserve money, and monetary policy rate on financial inclusion were estimated using ordinary least squares (OLS), followed by fixed and random effects models to account for unobserved heterogeneity. The Hausman test guided model selection, before estimation, panel unit root properties were assessed using the Levin Lin Chu test, the Harris Tzavalis test, and the Fisher type of Phillips Perron test to ensure the stationarity of the variables. Pair wise correlation analysis was conducted to check for potential multicollinearity among explanatory variables. The Breusch-Pagan LM test was used to determine whether panel effects were present, thereby supporting the selection of appropriate panel models. The generalised method of moments (GMM) was applied, using lagged explanatory variables as instruments. GMM's capacity to handle dynamic relationships and simultaneity bias strengthened the reliability of the findings on monetary policy's influence on financial inclusion in West Africa. The limitation of this study arose from the context-dependent nature of the effectiveness of monetary policy tools, which made it challenging to generalise the findings across different periods or regions.

Results and Discussion

The analysed research data reported the mean, standard deviation, minimum, and maximum values of all variables, providing an overview of their central tendencies and dispersion. The FINC, derived from principal component analysis of penetration, availability, and usage indicators, recorded a mean of 0.3525 and a standard

deviation of 1.2013, signifying low average inclusion and considerable dispersion. The minimum value (0.000) confirmed that some countries still had extremely limited inclusion, while the maximum (16.6526) suggested that others performed relatively well during the study period. The CRR averaged 17.2924%, with a low standard deviation (0.5538), reflecting stable liquidity control, though the range from 7.4596% to 35.9750% showed occasional strong interventions. MS averaged 15.6611%, with a higher variability (SD = 1.4681) and a wide range (2.6117-41.6622), indicating active liquidity management. OMO had a mean of 21.1597 and a large standard deviation (17.8084), revealing substantial fluctuations in the use of this policy tool. Table 1 showed the summary of dataset in the descriptive statistics that summarised the characteristics of the dataset used in this study.

Table 1. *Summary statistics*

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
FINC	192	0.3525	1.2013	0.0000	16.6526
CRR	192	17.2924	0.5538	7.4596	35.9750
MS	192	15.6611	1.4681	2.6117	41.6622
OMO	192	21.1597	17.8084	9.4988	33.0476
LIQR	192	56. 8223	3.4356	17.8074	78 .3409
RM	192	9.6300	0.3466	1.2891	25.2688
INF	192	12.94439	13.08138	-1.267686	65.7418
MPR	192	18.95445	8.99935	5.94846	41.73296

Note: *FINC – financial inclusion, CRR – cash reserve ratio, MS – broad money supply, OMO – open market operation, LQR – liquidity ratio, RM – reserve money, MPR – monetary policy rate, INF – inflation*
Source: *World Bank Group (n.d.a; n.d.b)*

The liquidity ratio averaged 56.8223, with moderate variability (SD = 3.4356) but a broad range (17.8074-78.3409), reflecting shifts between relaxed and stringent liquidity requirements. Reserve money (RM) was relatively stable (mean = 9.6300; SD = 0.3466) despite an extensive range (1.2891-25.2688), suggesting occasional sharp adjustments. Inflation averaged 12.94439, with very high volatility (SD = 13.08138), ranging from -1.267686% (deflation) to 65.7418% (hyperinflation episodes). The monetary policy rate (MPR) averaged 18.95445%, with a high standard deviation (8.99935) and a range from 5.94846% to 41.73296%, indicating shifts between accommodative and restrictive policy stances. Overall, these statistics depicted a region with persistently low financial inclusion, moderate stability in some policy variables (CRR, RM), but high variability in others (OMO, inflation, MPR), reflecting active and sometimes aggressive monetary management in response to diverse macroeconomic conditions. Multicollinearity among the variables was checked with both pair-wise correlation and variance inflation factor. The correlational matrix of each pair of independent variables was shown in Table2.

Table 2. *Pair-wise correlation*

Variable	FINC	CRR	MS	OMO	LIQR	RM	INF	MPR
FINC	1.0000							
CRR	0.0126	1.0000						
MS	0.1219	0.3210	1.0000					
OMO	0.0921	0.1132	0.4391	1.0000				
LIQR	-0.1156	0.2781	0.3330	0.0019	1.0000			
RM	0.0596	0.0218	0.0112	0.0120	0.5611	1.0000		
INF	0.4119	0.5329	0.2270	0.0115	0.0220	0.0591	1.0000	
MPR	0.0147	0.1101	0.4900	0.3219	0.3520	0.1791	0.2431	1.0000

Note: *FINC – financial inclusion, CRR – cash reserve ratio, MS – broad money supply, OMO – open market operation, LQR – liquidity ratio, RM – reserve money, MPR – monetary policy rate, INF – inflation*
Source: *World Bank Group (n.d.a; n.d.b)*

D.N. Gujarati & D.C. Porter (2009) stated that, when the correlation coefficient was more than 0.8, the relationship between two independent variables became problematic. To put it another way, a multicollinearity problem arose when a pair of explanatory variables had a strong correlation of more than 80%. Regression analysis results that were tainted by multicollinearity were typically untrustworthy. In this study, there would be no multicollinearity issues when using the variables in the regression model. The regression model was then created to ascertain the impact of the explanatory variables as the test result demonstrated the lack of multicollinearity. The VIF was used to further explore the likelihood of multicollinearity among the regressors (Table 3).

Table 3. *Results of use of VIF*

Variable	VIF	1/VIF
FINC	1.27	0.787402
CRR	2.70	0.37037
MS	1.99	0.502513
OMO	2.25	0.444444
LIQR	1.79	0.558659
RM	2.30	0.434783
INF	1.99	0.502513
MPR	1.65	0.606061
Mean VIF	**1.99**	

Note: *FINC – financial inclusion, CRR – cash reserve ratio, MS – broad money supply, OMO – open market operation, LQR – liquidity ratio, RM – reserve money, MPR – monetary policy rate, INF – inflation*
Source: *World Bank Group (n.d.a; n.d.b)*

The VIF and its inverse, also known as tolerance, for each independent variable was shown in Table 3. Thus, a variable was extremely collinear if its VIF was more than 5, and vice versa. According to the data, every variable had a VIF of less than five. This implied that it was not collinear. To establish stationarity for these variables, unit root test was conducted, as shown in Table 4, following three procedures, which included the Levin-Lin-Chu test, Harris-Tzavalis test, and Fisher-type of Phillip-Perron test.

Table 4. *Results of unit root tests*

	Levin-Lin-Chu		Harris-Tzavalis		Fisher-type Phillip-Perron		Stationarity
Variable	Statistics	p-value	Statistics	p-value	Statistics	p-value	Order of I
FINC	6.29	0.001	-7.40	0.000	10.01	0.000	At level
CRR	-8.43	0.000	-5.12	0.000	3.04	0.041	At level
MS	-3.11	0.038	5.39	0.000	3.62	0.010	At 1st difference
OMO	9.33	0.000	8.13	0.000	7.44	0.000	At 1st difference
LIQR	3.90	0.010	11.50	0.000	3.00	0.0431	At level
RM	5.51	0.000	7.32	0.000	8.71	0.000	At level
INF	11.92	0.000	14.55	0.000	3.09	0.0447	At 1st difference
MPR	7.11	0.000	19.00	0.000	12.21	0.000	At level

Note: *FINC – financial inclusion, CRR – cash reserve ratio, MS – broad money supply, OMO – open market operation, LQR – liquidity ratio, RM – reserve money, MPR – monetary policy rate, INF – inflation*
Source: *World Bank Group (n.d.a; n.d.b)*

Since the null hypothesis in these tests assumed the presence of a unit root, significant test statistics showed that the variables were stationary meaning their mean and variance remained stable over time. The confirmation of stationarity implied that the data series do not exhibit random walks or persistent trends that could distort regression results. This stability strengthened the reliability of the estimated models, allowing meaningful interpretation of how monetary policy tools influenced financial inclusion. In the context of West Africa, stationary monetary indicators such as money supply, liquidity ratio, and policy rate suggested that the region's monetary environment had achieved a degree of consistency, which was crucial for assessing policy effectiveness. Likewise, a stationary financial inclusion index indicated that changes in inclusion levels were driven by policy adjustments and structural reforms rather than random fluctuations. The results of the Breusch-Pagan LM test, which compared the simple Pooled OLS model with the random-effects estimator, were presented in Table 5.

Table 5. *Results of Breusch-Pagan LM test*

Breusch-Pagan LM	Statistics	Degrees of Freedom	Probability value
Values	19.233	190	0.002

Source: *World Bank Group (n.d.a; n.d.b)*

The LM statistic produced a p-value of 0.002, which was below the 0.05 significance threshold. This led to the rejection of the null hypothesis that the variance across entities was zero, confirming the presence of significant individual effects among the West African countries. In other words, the differences in financial inclusion and monetary policy outcomes across these countries were not merely due to random variation but were systematically influenced by country-specific characteristics by regulatory quality, financial infrastructure, and

economic structure. Consequently, the Pooled OLS model, which assumed homogeneity across cross-sections, was unsuitable for this dataset. This result justified the use of panel estimators that can account for such heterogeneity. Therefore, to identify the most appropriate specification, the study proceeded with the Hausman test to distinguish whether the unobserved effects were correlated with the explanatory variables, thereby guiding the choice between fixed-effects and random-effects models (Table 6).

Table 6. *Results of Hausman test*

Test summary	Chi-square statistic	Chi-square degrees of freedom	Probability value
Cross-section random	146.425	191	0.0000

Source: *World Bank Group (n.d.a; n.d.b)*

Thus, the estimate of Hausman test (146.425) was high and significant, its calculated p-value (0.0000) was also lower than the significance level of 5%. Therefore, the null hypothesis that the discrepancies in the estimated parameters produced by the two estimation procedures were not systematic must be rejected. Put another way, the fixed effects model was more suitable for the study since the null hypothesis was rejected because the p-value was less than 0.05. The fixed effects technique was consequently used for this investigation because it yields superior results for the model. Pooled OLS, fixed effect models, and random effect models were used to estimate the regression models in Table 7.

Table 7. *Summary of model estimation*

Variable	Pooled OLS coefficient (p-value)	Fixed effect coefficient (p-value)	Random effect coefficient (p-value)	System GMM coefficient (p-value)
C	5.124295 (0.000) ***	7.43042 (0.000) ***	-6.848051 (0.3296)	–
CRR	-0.1336984 (0.554)	-0.18154 (0.637)	-0.114936 (0.686)	0.158179 (0.071)
MS	2.787544 (0.000) ***	2.948901 (0.000) ***	3.07944 (0.000) ***	0.561400 (0.011) **
OMO	-0.072400 (0.000) ***	0.011170 (0.000) ***	0.091771 (0.000) ***	0.110112 (0.000) ***
LIQR	0.661459 (0.138)	1.591667 (0.008) ***	1.064279 (0.037) **	0.179036 (0.001) ***
RM	0.602888 (0.227)	0.800120 (0.012) **	-0.602402 (0.257)	-0.257014 (0.252)
INF	0.000983 (0.870)	-0.001634 (0.914)	0.000404 (0.961)	-0.009507 (0.639)
MPR	0.033017 (0.000) ***	0.040445 (0.000) ***	0.038614 (0.000) ***	-0.404670 (0.039) **
R^2	0.6298	0.6834	0.6782	–
Adjusted R^2	0.6043	0.6464	0.63764	–
F-statistic	22.930 (0.000)	22.5900 (0.000)	9.490432 (0.000)	Wald $\chi^2(8) = 392.37$ (0.000)
DW	1.9031	2.4058	2.0370	–
AR(1)	–	–	–	-0.31 (0.758)
AR(2)	–	–	–	-0.66 (0.508)
Sargan test	–	–	–	1.76 (0.8290)

Note: *C – constant term, CRR – cash reserve ratio, M2 – broad money supply, OMO – open market operation, LIQR – liquidity ratio, RM – reserve money, MPR – monetary policy rate, INF – inflation, R^2 – coefficient of determination, DW – Durbin-Watson statistic, AR(1) – Arellano-Bond test for first-order serial correlation, AR(2) – Arellano-Bond test for second-order serial correlation*

Source: *World Bank Group (n.d.a; n.d.b)*

This multi-model approach controlled for unobserved heterogeneity, serial correlation, and endogeneity. Results indicated that the CRR exhibited a negative and insignificant effect in static models but turned positive in the dynamic specification, suggesting potential stability gains for inclusion, though not statistically robust. MS consistently showed a strong and significant positive effect across all estimations, confirming its role in enhancing liquidity and credit access. OMO shifted from negative in OLS to positive and significant in FE (fixed effects), RE (random effects), and GMM, implying that, when heterogeneity was addressed, active OMO supported inclusion through liquidity management. The LIQR was significant and positive in FE, RE, and GMM, indicating that stronger bank capitalisation fostered broader access. RM yielded mixed results, positive and significant in FE but negative or insignificant, elsewhere suggesting its effectiveness depended on the efficiency of credit transmission channels. INF remained insignificant in all models, while the MPR was positive and significant in static estimations but negative and significant in GMM, reflecting a trade-off between short-run savings attraction and long-run credit constraints. Model diagnostics reported R^2 values between 62.98% and 68.34% for static models, with significant F-statistics, while GMM diagnostics confirmed the absence of first- and second-order serial correlation (AR(1), $p = 0.758$; AR(2), $p = 0.508$) and instrument validity (Sargan test, $p = 0.8290$). Overall, MS, OMO, and LIQR emerged as consistent and effective policy tools for enhancing financial inclusion in West Africa.

The results indicated that OMO had a significant positive relationship with financial inclusion, suggesting that effective liquidity management through the buying and selling of government securities can deepen financial markets and expand access to financial services. In the West African context, where liquidity constraints persist, well-implemented OMO can encourage banks to extend credit, particularly to underserved populations. This finding aligned with D.O. Olayungbo & B.A. Iqbal (2021), though O.F. Ngaikedi *et al.* (2023) caution that without complementary institutional reforms, the impact of OMO may be limited. Similarly, the LIQR showed a significant positive effect, implying that higher bank liquidity supported confidence, deposit mobilisation, and credit extension. This supported C.K. Adjasi & C.A. Yartey (2007) but contrasted with A.R. Olajide *et al.* (2022), who found the effect to be statistically insignificant, underscoring the need for targeted inclusion programmes alongside liquidity improvements. RM exhibited a negative but statistically insignificant relationship with financial inclusion, indicating that expansion of the monetary base alone does not guarantee broader access to formal financial services unless paired with structural reforms, as emphasised by S. Ben Naceur *et al.* (2020). Consistent with this, studies such as by E.J. Tonuchi *et al.* (2021) and A.R. Olajide *et al.* (2022) found RM's influence weak or inconsistent. INF also showed an insignificant positive effect, suggesting that price changes, within the observed range, do not directly impact inclusion, though other studies document significant negative effects, particularly in contexts of higher inflation volatility. MPR showed a significant positive relationship with financial inclusion, potentially reflecting monetary tightening as a signal of macroeconomic stability, which can attract engagement with formal finance. Findings suggested that, while tools like OMO, LIQR, and MPR can foster inclusion, measures such as RM expansion and inflation control alone were insufficient. A holistic policy mix that integrated monetary tools with targeted financial inclusion strategies was therefore essential for sustainable gains in West Africa.

Conclusions

The results of this study revealed that monetary policy variables significantly influenced the depth and outreach of financial inclusion within the West Africa. The fixed effects model was selected based on the Hausman test ($\chi^2 = 146.425$, $p < 0.01$), and the results showed that money supply ($\beta = 2.948901$, $p < 0.01$) had the strongest positive effect, indicating that liquidity expansion and increased credit availability were crucial for deepening formal financial participation. Open market operations ($\beta = 0.011170$, $p < 0.01$), liquidity ratio ($\beta = 1.591667$, $p < 0.01$), and reserve money ($\beta = 0.800120$, $p = 0.012$) also had significant positive impacts, highlighting the importance of effective liquidity management. In addition, monetary policy rate ($\beta = 0.040445$, $p < 0.01$) showed a small positive effect in the fixed effects model, suggesting that moderate interest rate adjustments may not constrain access to financial services in the short term. In contrast, cash reserve ratio ($\beta = -0.18154$, $p = 0.637$) and inflation (INF, $\beta = -0.001634$, $p = 0.914$) were not statistically significant, implying limited direct influence on financial inclusion outcomes. The study concluded that expansionary monetary instruments, particularly money supply growth, active open market operations, and sound liquidity management, were the most effective policy levers for improving financial inclusion in West Africa. Policymakers should adopt liquidity-supportive measures alongside moderate interest rate regimes, complemented by targeted interventions such as digital finance expansion, microfinance development, and financial literacy initiatives. Future research should disaggregate these effects at the country level to better understand the structural and institutional factors that shape inclusive finance in the region.

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Conflict of Interest

None.

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Механізми трансмісії монетарної політики та фінансова інклюзія в країнах Західної Африки

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Анотація. Метою дослідження було вивчити вплив монетарної політики на фінансову інклюзію у шістнадцяти країнах Західної Африки, використовуючи панельні дані з бази даних Міжнародного валютного фонду за період 2010-2021 років. Фінансова інклюзія вимірювалася за допомогою складного індексу, створеного методом головних компонентів, що включав показники проникнення фінансових установ, доступності та використання. У результаті були визначені такі показники: грошова маса (MS, $\beta = 2{,}948901$, $p < 0{,}01$), операції на відкритому ринку (OMO, $\beta = 0{,}011170$, $p < 0{,}01$), ліквідність банківського сектору (LIQR, $\beta = 1{,}591667$, $p < 0{,}01$), резервні гроші (RM, $\beta = 0{,}800120$, $p = 0{,}012$) та облікова ставка (MPR, $\beta = 0{,}040445$, $p < 0{,}01$). Коефіцієнт обов'язкових резервів (CRR, $\beta = -0$, 18154, $p = 0{,}637$) та інфляція (INF, $\beta = -0{,}001634$, $p = 0{,}914$) не мали статистично значущого впливу. Модель пояснила близько 68 % змін у фінансовій інклюзії ($R^2 = 0{,}6834$). Результати показали, що грошова маса значно та позитивно впливала на фінансову інклюзію, що свідчить про те, що розширення ліквідності збільшувало кредитну спроможність банків і сприяло більш широкому охопленню. Операції на відкритому ринку також мали сильний позитивний ефект, оскільки ефективне управління ліквідністю сприяло стабільності та стимулювало доступ до фінансових послуг. Ліквідність банківського сектору позитивно впливала на інклюзію, зміцнюючи довіру до депозитарних установ і підвищуючи стійкість банків. Резервні гроші та монетарна політика також позитивно та значущо впливали на фінансову інклюзію. Коефіцієнт обов'язкових резервів і інфляція не мали значущого впливу, що вказувало на їх опосередкований вплив або обмеження через структурні фінансові проблеми в регіоні. Було зроблено висновок про те, що монетарні політики, що сприяли ліквідності, стали критично важливими для покращення фінансової інклюзії в Західній Африці. Було рекомендовано розширення грошової маси, зміцнення операцій на відкритому ринку, посилення банківських ліквідних показників та ухвалення обережної політики щодо облікових ставок, підтримуваної цифровими фінансовими послугами та ініціативами з підвищення фінансової грамотності

Ключові слова: коефіцієнт обов'язкових резервів; операції на відкритому ринку; ліквідність банківського сектору; грошова маса; резервні гроші