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## **The Role of Money Supply and Commercial Bank Branches in Economic Growth in West Africa**

**Anastasia Uzonna Ezewulu<sup>1</sup>, Clement Ifebuolili Sunday Ezeanyeji<sup>2</sup>**

<sup>1</sup>Department of Economics Nwafor Orizu College of Education Nsugbe

<sup>2</sup>Department of Economics, Chukwuemeka Odumegwu Ojukwu University, Igbariam  
Campus, Anambra state, Nigeria

West African economies continue to face challenges in achieving sustainable economic growth, despite ongoing financial sector reforms aimed at improving access to credit and financial services. Limited banking infrastructure, inefficient allocation of liquidity, and uneven financial inclusion have constrained investment and productivity, raising questions about the effectiveness of traditional financial expansion measures such as money supply growth and commercial bank branch proliferation. The study examined the relationship between financial development and economic growth in West Africa using the augmented growth framework of N. Gregory Mankiw, David Romer, and David Weil, which extends the Robert Solow model by incorporating human capital. A dynamic panel model was estimated using the System Generalized Method of Moments developed by Manuel Arellano and Stephen Bond to address endogeneity and heterogeneity. Annual data (2004–2023) from 16 West African countries were analysed. Variables included GDP, financial inclusion indicators, investment, institutional quality, and human development. Pre-estimation and diagnostic tests ensured stationarity, validity, and robustness of results. The results showed no multicollinearity among variables, as correlations were moderate, with RGDP strongly related to GFCF (0.8568) and moderately to HDI (0.1633). Cross-sectional dependence tests (Pesaran = 3.295; Friedman = 37.841) confirmed dependence, leading to the inclusion of time dummies. System GMM results revealed strong growth persistence (0.998). Broad money supply (−0.0006) and commercial bank branches (−0.013) had significant negative effects on growth, suggesting inflationary pressures and banking inefficiencies. HDI showed a weak positive effect (0.380). AR(2) (0.390) and Hansen (0.268) tests confirmed model validity, leading to rejection of the null hypothesis. In conclusion, sustainable economic growth in West Africa requires not only financial sector expansion but also improved financial intermediation, effective monetary management, and inclusive access to financial services. Policymakers should focus on combining monetary stability with human capital development and targeted financial inclusion strategies.

**Keywords:** Money supply, Commercial bank branches, Economic growth, Financial inclusion, West Africa.

## 1. Introduction

Economic growth in developing economies has persistently lagged behind expectations, despite numerous reforms aimed at strengthening financial systems and promoting inclusion. A central challenge has been how financial markets and institutions can be leveraged to mobilize savings, allocate credit efficiently, and enhance investment particularly in regions where many people lack access to formal financial services. Limited monetary liquidity and sparse banking infrastructure can restrict credit to productive sectors, weaken the monetary policy transmission mechanism, and exacerbate inequalities in access to finance. Against this backdrop, scholars have increasingly examined the roles of money supply (as a measure of financial depth) and the distribution of commercial bank branches (as an indicator of financial inclusion) in influencing economic growth, especially in developing and emerging markets (Van et al, 2021; Aransiola et al, 2025; Atta & Ibrahim, 2024).

Money supply, often measured by broad aggregates such as M2, represents the total liquidity in an economy and plays a critical role in stimulating borrowing, investment, and economic activity (Odimegwu & Odumodu, 2020). Proper management of liquidity enhances capital formation and supports output growth, as demonstrated in property and land use contexts where effective financial flows drive development (Odimegwu & Anyakora, 2023). In infrastructure finance, adequate liquidity underpins sustainable investment in economic projects (Odimegwu & Ikeotuonye, 2023). Similarly, green property management initiatives rely on financial resources to improve efficiency and growth (Anyakora et al., 2025). Economic shocks, such as the COVID-19 pandemic, reveal that weak monetary flow limits sectoral growth (Ikechukwu & Chinwe, 2021). Environmental and educational adaptations further highlight how well-managed financial resources contribute to productive outcomes (Munonye et al., 2022). Recent empirical evidence supports the positive role of money supply growth in enhancing economic output. For example, a panel regression analysis of Western Balkan countries demonstrated a positive and significant effect of M2 on economic growth, concluding that higher money supply stimulates investment, enhances liquidity, and promotes consumption, which are critical drivers of growth in economies with weak financial markets (Bajrami et al., 2025).

In Nigeria, similar patterns have been observed. Empirical research found that money supply has a positive and significant relationship with real GDP, highlighting that monetary expansion enhances liquidity and, by extension, economic activity (Ozor et al., 2023). This suggests that in contexts where capital is scarce, broader money supply can act as a growth lubricant by easing firms' and households' access to financial resources. However, it is important to note that the long-run effectiveness of money supply on growth often depends on macroeconomic stability, inflation control, and the efficiency of financial intermediaries. Uncontrolled monetary expansion can lead to inflationary pressures, undermining real growth outcomes. Moreover, money supply on its own cannot guarantee growth if credit remains poorly allocated or if prevailing inflation erodes real purchasing power.

Commercial bank branches are an important physical indicator of financial inclusion. Branch expansion reduces geographical and informational barriers to accessing financial services, enabling households and firms especially in rural areas to save securely, obtain credit, and engage in investment activities. Access to credit is particularly vital for small and medium enterprises (SMEs), which often drive job creation and innovation in developing economies. Recent empirical evidence supports the growth-enhancing role of financial inclusion indicators such as bank branches. A study using SVAR methodology in Nigeria found that commercial bank branches positively relate to real GDP, indicating that increased banking infrastructure can improve financial access and stimulate economic activity (Musa et al.,

2024). This aligns with broader financial inclusion theory, where deeper banking networks lower transaction costs, encourage formal savings, and improve the efficiency of credit distribution.

Further supporting this view, research on financial inclusion found that deposits and loans extended from commercial bank branches significantly influenced economic growth, indicating that expanded bank penetration can facilitate productive investment and financial participation (Odumusor et al., 2024). These findings underscore the importance of physical banking infrastructure in contexts where digital platforms are still emerging and where trust in formal financial systems remains low.

Both money supply and commercial bank branches operate through interconnected mechanisms. Expanded money supply increases the pool of funds available for lending, but without adequate banking infrastructure to intermediate these funds, the potential impact on economic activity may be muted. A robust network of commercial bank branches enhances the effectiveness of monetary policy. When branches are widely distributed, central bank actions such as adjustments to reserve requirements or open market operations that transmit more smoothly through the banking system into credit markets and the broader economy. In this way, monetary expansion and branch penetration can work synergistically to promote growth. Additionally, bank branches provide local financial services tailored to community needs, fostering trust and reducing reliance on informal lending. This local presence can be particularly impactful in rural and underserved regions where formal financial services are absent.

The evidence suggests that both money supply growth and expanded commercial bank branch networks are important contributors to economic growth in developing economies. Policymakers should therefore aim for balanced monetary expansion combined with proactive measures to deepen banking infrastructure. Efforts to control inflation and improve institutional quality remain essential to ensure that increased liquidity translates into real economic output. Moreover, as digital financial services grow, policy frameworks should support the complementarity of traditional bank branches with digital platforms to enhance financial inclusion further.

The study on the role of money supply and commercial bank branches in economic growth in West Africa was important because the region continues to face financial deepening challenges, limited credit access, and uneven economic expansion. Despite recent growth improvements in Sub-Saharan Africa, economic gains have not significantly reduced poverty, partly due to structural weaknesses in financial systems and limited access to formal banking services. This created a gap in understanding how monetary expansion and banking outreach can stimulate inclusive growth.

Money supply influences liquidity, credit availability, and investment, which are essential drivers of economic growth. However, recent empirical evidence suggested that monetary expansion alone may not guarantee improved welfare outcomes, indicating weak transmission mechanisms within African financial systems (Anjande et al., 2022). This revealed the need to examine how financial intermediation structures—such as commercial bank branch expansion—strengthen the effectiveness of monetary policy.

Commercial bank branches play a critical role in financial inclusion by mobilizing savings, facilitating credit access, and integrating rural populations into formal financial systems. Expanding banking networks improves capital formation and supports small and medium enterprises, which are central to economic transformation. Nevertheless, financial

infrastructure in many West African countries remains underdeveloped, limiting the reach of banking services and weakening monetary policy transmission.

Furthermore, growing reliance on domestic financial systems in Sub-Saharan Africa has placed pressure on local banks and highlighted the need for stronger financial sector development to support private investment and growth. This underscores the importance of understanding how expanding bank branches and improving money supply management can enhance financial stability and growth.

The study addressed critical gaps by examining how money supply and banking outreach jointly influence economic growth. Its findings were expected to guide policymakers in strengthening financial inclusion, improving monetary policy effectiveness, and promoting sustainable economic development in West Africa.

### **1.1 Research Question**

The study formulated the following research questions;  
What is the impact of money supply and commercial bank branches on the economic growth of West Africa?

### **1.2 Objective of the Study**

Evaluate the impact of money supply and commercial bank branches on the economic growth of West Africa.

### **1.3 Hypothesis One**

**H0<sub>2</sub>:** Money supply and commercial bank branches have no significant impact on economic growth in West Africa.

## **2. Methodology**

This study adopted a comprehensive econometric methodology to examine the relationship between financial development and economic growth in West Africa. The methodological framework integrated modern growth theory, dynamic panel modelling, and rigorous statistical testing to ensure reliable and policy-relevant results.

**Theoretical Framework:** The study was anchored on the augmented neoclassical growth model developed by Mankiw et al (1992), which extended the Robert Solow and Trevor Swan growth model by incorporating human capital as a determinant of long-run economic growth. The model retained the assumption of constant returns to scale but emphasized that investment in physical and human capital significantly increased output per worker. This framework was consistent with endogenous growth theory, influenced by the works of Robert Lucas Jr. and Paul Romer, which highlighted the roles of knowledge, innovation, and policy in sustaining growth.

The production function assumed a single-sector economy in which output depended on physical capital, human capital, labour, and technology. Technological progress was treated as exogenous, while human capital accumulation and investment rates influenced growth dynamics. The model was expressed in intensive form to measure output per effective labour, enabling cross-country productivity comparisons. To examine financial development effects, the production function was extended to include financial development variables (FD) and other growth determinants (Z). This modification enabled the analysis of how financial

deepening influenced economic performance through improved resource allocation, capital accumulation, and productivity.

**Model Specification:** The study specified dynamic panel models and estimated them using the two-step System Generalized Method of Moments (SGMM). This technique was selected because it is suitable for panel datasets with many cross-sections and relatively short time periods. The SGMM estimator addressed endogeneity, omitted variable bias, and unobserved heterogeneity while improving estimation efficiency. One of the models examined the effect of financial inclusion indicators such as broad money supply and commercial bank branch expansion on economic growth. Foreign direct investment, gross fixed capital formation, and human development indicators were included as control variables. Lagged dependent variables were incorporated to capture persistence effects in economic growth.

**Definition of Variables:** Economic growth was proxied by real gross domestic product (RGDP), measured in constant 2015 U.S. dollars. Foreign direct investment (FDI) represented cross-border investments capable of transferring technology, generating employment, and stimulating productivity. Human capital was measured using the Human Development Index (HDI), which combined indicators of health, education, and income. Financial development variables included domestic credit to the private sector, broad money supply (M2), ATM penetration, and commercial bank branch density, all of which reflected financial access and inclusion. Gross fixed capital formation measured domestic investment and capital accumulation, while unemployment captured labour market conditions. Institutional quality variables including government effectiveness and political stability which measured governance strength and the investment climate.

**Estimation Technique and Justification:** The study employed the dynamic panel System GMM estimator developed by Manuel Arellano and Stephen Bond and later refined by Richard Blundell. The method built on the Generalized Method of Moments introduced by Lars Peter Hansen. System GMM improved estimation accuracy by combining equations in levels and first differences, reducing finite sample bias and addressing endogeneity. The technique was preferred because it treated explanatory variables as valid instruments, corrected heteroscedasticity, and preserved observations even in the presence of data gaps. Instrument validity was confirmed using over-identification tests such as the Sargan and Hansen tests.

**Pre-Estimation and Diagnostic Tests:** Several preliminary tests were conducted to ensure data reliability and model validity. Descriptive statistics were computed to understand data distribution and variability. Panel unit root tests including Levin-Lin-Chu, Im-Pesaran-Shin, and PP-Fisher tests which were performed to confirm stationarity. Multicollinearity was examined using correlation matrices to prevent biased estimates. Cross-sectional dependence was tested using the Pesaran test, while the Bond test was used to determine whether system GMM was preferable to difference GMM. Diagnostic checks included the Hansen test for instrument validity and the Arellano-Bond serial correlation test. The estimator was considered consistent when first-order serial correlation was present but second-order correlation was absent.

**Data Sources and Coverage:** The study used annual data covering 16 West African countries from 2004 to 2023. Data were obtained from the World Bank's World Development Indicators, the World Governance Indicators, the IMF Financial Access Survey, and the UNDP Human Development Reports. These sources provided reliable

measures of macroeconomic performance, financial inclusion, governance quality, and human development.

**Software and Analytical Tools:** Data were analysed using Stata 15 and E-Views 10 software packages, which were appropriate for dynamic panel estimation and advanced econometric analysis.

### 3. Results and discussion

#### 3.1. Correlation Matrix of the Variables

To evade the problem of collinearity, this study examined the patterns in the correlation matrix of the variables. This matrix is presented in Table 1. We find that the variables show no signs of high correlation with each other.

**Table 1: Correlation Matrix of the Variables**

**Panel B:** Correlation Matrix for the model

VARIABLES	RGDP	BMS	CBB	FDI	GFCF	HDI
RGDP	1.0000					
BMS	-0.0937	1.0000				
CBB	-0.0235	0.6233	1.0000			
FDI	-0.1092	-0.0135	0.0490	1.0000		
GFCF	0.8568	-0.0629	-0.0232	-0.0852	1.0000	
HDI	0.1633	0.6782	0.7417	0.0439	0.1270	1.0000

PANEL B: THE MODEL	LOGRGDP
Pesaran - fe	3.295 (0.0010)
Pesaran - re	3.720 (0.0002)
Friedman - fe	37.841 (0.0003)
Friedman - re	41.702 (0.0001)
Frees' - fe	0.1782 (0.305)
Frees' - re	0.1782 (0.186)
<b>DECISION</b>	
	<b>CD</b>

**Source:** Author, Stata 15.0.

**Notes:** The Frees' tests report alpha values, while the Pr values for the trials are based on Pesaran and Friedman. In all cases, the average absolute values are given in parentheses. Cross-sectional independence is represented by CID, whereas cross-sectional dependence is represented by CD.

Table 1 shows the results of the cross-sectional dependent test. The results in Table 4.5, panels A and B, indicate the presence of cross-sectional dependence in model one. The

results show the presence of cross-sectional dependence; thus time dummy is included to address the identified issue in system GMM results following Tchamyu et al. (2019), Ogbuabor et al. (2023), and Emeka et al. (2024).

### 3.2. System GMM Regression Results for the Financial Inclusion and Economic Growth (real GDP) The model

Please note that the second specific goal of this study is to assess how the money supply and commercial bank branches affect economic growth in West African economies. In order to accomplish this goal, the study used the two-step system GMM estimator to estimate the underlying model. The findings are shown in Table 2.

**Table 2: Result for Objective Two (dependent variable = *LOGRGDP*)**

Variables	System GMM Estimator
LOGRGDP LI.	0.9977589*** (0.0060894)
BMS	-0.0005757** (0.0002828)
CBB	-0.0125333** (0.0055834)
FDI	0.001111 (0.0006431)
LOGGFCF	0.0032334 (0.0142487)
HDI	0.38002* (0.2064295)
CONS	0.6620649 (1.853248)
Observations	266
Number of c_id	14
No. of Instrument	14
AR1	0.013
AR2	0.390
Hansen	0.268
Time Effect	Yes

**Source:** Author, Stata 15.0

**Note:** Estimated coefficients are reported while the corrected standard errors are in parentheses. \*  $p < 0.10$ . \*\*  $p < 0.05$ . \*\*\*  $p < 0.01$ .

### Hypothesis

**H0<sub>2</sub>:** Money supply and commercial bank branches have no significant impact on economic growth in West African economies.

The results indicate that broad money supply (BMS) has a statistically significant negative impact on economic growth, suggesting that increased money supply may lead to inflationary pressures that hinder growth. Additionally, the expansion of commercial bank branches also had a negative and statistically significant effect on economic growth. This suggests that increasing the number of commercial bank branches may not necessarily result in higher growth, potentially due to inefficiencies in banking infrastructure. Therefore, the null hypothesis (H0<sub>2</sub>) is rejected, as both money supply and commercial bank branches were found to significantly influence economic growth.

The results in Table 2 indicate that a one-unit increase in the lag of economic growth is associated with approximately a 0.998-point increase in current economic growth, indicating a strong persistence of economic growth. According to Akinlo and Eita (2014), economic growth tends to exhibit persistence, where past economic activities significantly influence future growth, supporting the positive coefficient of lag of economic growth. However, studies argue that the effect of past growth on current growth may diminish over time, especially in economies undergoing structural changes, suggesting a potentially smaller coefficient than the one observed here.

The coefficient for broad money supply (BMS) is negative and statistically significant at the 5% level, with a value of -0.0006. This suggests that an increase in broad money supply decreases economic growth by 0.06% in the short term. Broad money could be reflecting inflationary pressures or inefficiencies in the financial system, which might hinder growth. A study by Ghosh et al. (2020) shows that excessive broad money growth in developing economies can lead to inflationary pressures, hindering growth in the long term. On the contrary, studies by Levine (2000) and Tchamyou et al. (2019) argue that money supply expansion promotes financial inclusion and subsequently enhances economic growth by increasing investment and consumption, especially in emerging markets. Also broad money, when appropriately managed, could stimulate economic growth by facilitating investments and enhancing liquidity in the financial system.

The estimated coefficient for commercial bank branches was discovered to be negative and statistically significant at the 5% level, with a value of -0.013. This implies that a unit increase in the expansion of commercial bank branches results in approximately a 1.3% drop in economic growth in West African countries. This is to say that an increase in the number of commercial bank branches might reduce economic growth in the short run. This could be due to diminishing returns from expanding physical banking infrastructure, or possibly inefficiencies and underutilization in the banking sector.

According to Nyarko (2015) and Atallah and Le (2006), the expansion of commercial bank branches in developing economies often has a limited impact on growth, as many branches may serve the urban elite and overlook the rural poor. Beck and Cull (2014) also argue that in underdeveloped regions, where financial systems are nascent, the expansion of bank branches can sometimes result in inefficient allocation of resources, undermining the intended benefits for growth. In contrast, Beck et al (2007) and Claessens et al. (2001) argue that expanding commercial bank branches improves financial access and promotes economic development by increasing credit availability to underserved regions.

A positive coefficient for HDI indicates that human development, as proxied by HDI, is positively associated with economic growth, notwithstanding it having a somewhat weak effect at the statistically significant level of 10%, implying that a unit change results in about 38% increase in economic growth of West African economies. This suggests that improved human capital can contribute to higher economic productivity. A study by Tchamyou et al. (2019) and Sachs et al. (2004) supports the positive effect of human capital development on economic growth in Africa, showing that improved HDI indices correlate with higher growth rates. However, Bloom and Canning (2001) argued that the impact of human development on economic growth may be delayed and dependent on factors like institutional quality. This was also supported by Dreher et al. (2013), who argue that the impact of human development on growth may not always be straightforward, especially in regions where poor governance or corruption hampers the effective use of human capital.

From Table 2, the Arellano-Bond tests for second-order serial correlation AR (2) indicate that all the models are free from the problem of serial correlation. In addition, the Hansen (1982) tests of over-identifying restrictions indicate that the hypothesis of jointly valid instruments cannot be rejected in all cases, implying that the set of instruments employed in the estimations satisfied the exogeneity condition required for obtaining valid regression estimates. Thus, there are valid over-identifying restrictions in all cases, and our models are adequate to inform policy.

## Conclusion

This study examined the role of money supply and commercial bank branches in shaping economic growth in West African countries using a dynamic panel System GMM framework. The findings revealed that financial sector variables exert significant influence on growth outcomes, though not always in the expected direction. Specifically, broad money supply exhibited a statistically significant negative effect on economic growth, suggesting that monetary expansion in the region may be associated with inflationary pressures, weak financial intermediation, or inefficient credit allocation that limits productive investment. This indicates that liquidity growth alone is insufficient to stimulate sustainable economic expansion without strong macroeconomic management and effective monetary transmission mechanisms.

Similarly, the expansion of commercial bank branches was found to have a significant negative impact on economic growth. This result implies that increasing the number of bank branches does not automatically translate into improved financial inclusion or economic performance. The negative relationship may reflect inefficiencies in banking operations, urban concentration of branches, underutilization of financial services, or high operational costs that outweigh the expected developmental benefits. It also suggests that physical banking expansion without corresponding improvements in service delivery, digital integration, and rural outreach may yield limited growth dividends.

Conversely, human development, as proxied by the Human Development Index, demonstrated a positive relationship with economic growth, reinforcing the importance of human capital development in enhancing productivity and long-term economic performance. The persistence of economic growth observed in the model further indicates that past growth trends strongly influence current performance, underscoring the need for consistent and stable economic policies.

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