

Dynamics of Bank Profitability and Growth in West African Economic and Monetary Union (WAEMU) Countries

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Article's history:

Received 5th of August, 2024; Received in revised form 9th of September, 2024; Accepted 12th of September, 2024; Available online: 15th of September, 2024. Published as article in the Volume XIX, Fall, Issue 3(85), 2024.

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Suggested citation:

Koffi, M. V. (2024). Dynamics of bank profitability and growth in West African Economic and Monetary Union (WAEMU) countries. *Journal of Applied Economic Sciences*, Volume XIX, Fall, 3(85), 327–336. [https://doi.org/10.57017/jaes.v19.3\(85\).08](https://doi.org/10.57017/jaes.v19.3(85).08)

Abstract:

The banking sector is vital to economic activity when it develops. Its development depends on the ability of banks to generate sufficient profits to meet their commitments. In this context, we set ourselves the objective of analyzing the effect of bank profitability on economic growth. The study covers the period from 1996 to 2023, and covers 7 WAEMU countries except Guinea-Bissau, for lack of data. Methodologically, we apply Bruno's (2005) Least Square Dummy Variable (LSDVC) bias correction approach to the dynamic unbalanced panel data model. The results indicate that bank profitability has a positive influence on economic growth in the WAEMU region, whatever the profitability index used. Inflation, Political stability and investment are not unrelated to economic growth in the union. It follows from these results that the union's authorities need to strengthen supervision of the banking sector to ensure that it remains profitable.

Keywords: bank profitability, growth, dynamic panel data, least square dummy variable (LSDVC).

JEL Classification: G20, O16, O40, C10.

Introduction

All countries aspire to well-being, and this can only be achieved through economic growth. Economic growth is based on a rigorous body of theory that breaks down into two blocs: the so-called exogenous growth theory and the so-called endogenous growth theory. Both the exogenous and endogenous theories recognise the driving role of technical progress in economic growth. According to the theory developed by the neoclassicals, led by Solow, technical progress, which is the driving force behind economic growth, is exogenous. Endogenous growth models, on the other hand, also attach great importance to technical progress, but assert that it is endogenous and therefore needs to be financed. It is with this in mind that integrating banks into the analysis of economic growth becomes a possible and important way of financing innovation.

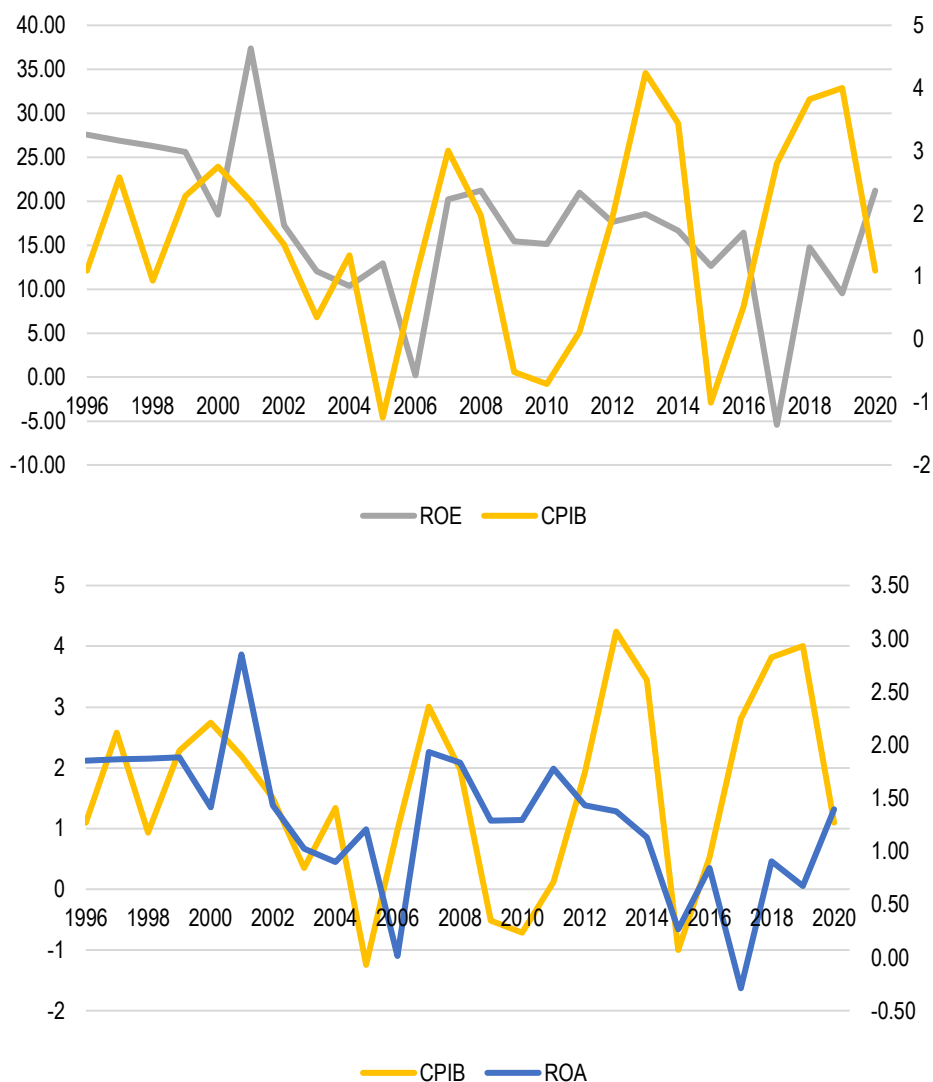
Hence the importance of banks in financing innovation, given their role in allocating large amounts of savings to investment projects. It's worth pointing out that traditional models of economic growth have ignored the role of the financial system, and banks in particular, in economic growth. The literature on endogenous growth with a financial system, on the other hand, argues that a well-developed banking system promotes economic growth (Pagano, 1993; King & Levine, 1993). These studies were prefigured by the pioneering contributions of Schumpeter (1911). The author explains that well-functioning banks stimulate technological innovation by identifying and financing entrepreneurs with innovative projects that have a high chance of success.

Through their functions, notably maturity transformation, transaction cost reduction and information production, banks efficiently allocate the resources needed to finance the economy. The deposit-taking and credit-granting activities that constitute their core business enable them to maximize their profits. In addition, a profitable bank can build up the capital cushion needed to meet its commitments (Vives, 2010). The profitability of a country's banking system is a necessary condition for its economic growth because a profitable banking system makes it possible to generate funds for development financing (Vives, 2010; De Bandt et al., 2017). The results of empirical work are far from converging. While for some, bank profitability stimulates economic growth (Aziz, 2020; Klein &

Weill, 2022; Reddy et al., 2023) for others, on the other hand, profitability negatively influences economic growth (Tan & Floros, 2012; Petkovskia & Kjosevskib, 2014).

However, this profitability may prove low in the presence of a crisis (De Bandt et al., 2017), following which one of the main measures is to reform the banking sector in order to stabilise it. The reforms undertaken in the WAEMU zone in response to the crisis of the 1980s are an illustration of this. Like other developing countries, the WAEMU banking system's reforms should make it possible to build a more efficient, robust and deeper financial system capable of supporting economic growth. Figure 1 shows the evolution of bank profitability and economic growth.

Figure 1. Trends in bank profitability and economic growth in WAEMU



While the literature on the link between profitability and economic growth seems mixed, the facts of the union also reflect this character (Figure 1). Thus, in what way can bank profitability stimulate economic growth in the WAEMU? The aim of this research is to analyse the effect of bank profitability on economic growth. This study differs from previous ones in two aspects:

- Firstly, most work in Africa in general and WAEMU in particular has focused on profitability factors (Tanimoune, 2003; Francis, 2013; Kiganda, 2014; Mebounou et al., 2015; Laryea, 2016; Hesse & Poghosyan, 2016; Moussa & Hdidar, 2019; Kanga et al., 2020; Orebiyi & Otolurin, 2021).
- Secondly, in the rest of the literature, the generalized method of moments is used extensively in examining the relationship between bank profitability and economic growth due to its asymptotic properties (Tan & Floros, 2012; Petkovskia & Kjosevskib, 2014; Aziz, 2020; Klein & Weill, 2022).

One of the weaknesses of the IV and GMM estimators is that their properties hold when N is large, so they can be severely biased and inaccurate in panel data with a small number of cross-sectional units. This is often the case in most macro-panels, but also in micro-panels where problems of heterogeneity force the researcher not to use all available information, but rather to select a subsample of individuals from the original panel to estimate the parameters of interest (Nickell, 1981; Kiviet, 1995). An alternative approach based on Least Square Dummy Variable (LSDVC) bias correction in dynamic panels is adapted (Bun & Kiviet, 2003; Bruno, 2005). Taking both observations into account, this study attempts to fill this gap in the literature.

1. Review of Literature

The banking system has traditionally been linked to economic growth through its development (Gurley & Shaw, 1955; McKinnon, 1973; Shaw, 1973, Pagano, 1993). Recent work, however, has focused on the effect of bank profitability on economic growth. Bank profitability can influence economic growth through various channels. Firstly, by exerting an impact on financial stability, bank profitability can promote economic growth. Secondly, bank profitability can be associated with economic growth through bank competition. Goddard, et al (2004) have shown that the key factor in bank profitability is competition. Furthermore, low competition in the banking sector increases bank profits, but leads to high borrowing rates, which can increase the barriers to firm financing (Beck et al., 2004). However, some researchers argue that low bank competition promotes access to credit (Petersen and Rajan, 1994; Petersen and Rajan, 1995).

Alam et al. (2021) use dynamic vector correction model (VECM), fully modified ordinary least squares (FMOLS) and dynamic ordinary least squares (DOLS) to examine the long-run relationship between bank performance and economic growth in India. The study is based on a panel data of 20 public sector banks for the period 2009 to 2019. The results indicate that bank-related variables are co-integrated with economic growth. Further analysis indicates a positive relationship between bank performance (interest margin and return on assets) and economic growth. Zeqiraj et al. (2020) study the impact of banking sector performance on economic growth in thirteen Southeast European countries over the period 2000-2015. Using the generalised method of moments (GMM), the main empirical result suggests a positive and significant impact of banking sector performance on economic growth. According to the authors, this implies that banking efficiency is one of the main determinants of overall economic growth.

In this context, Nassim et al. (2024) investigate the implications of the regulatory environment, macroeconomic factors, monetary conditions and uncertainty on the operational and investment efficiency of the banking sector in G7 and E7 countries between 2001 and 2020. The estimates suggest that leverage, capital adequacy, monetary conditions, economic growth, price stability and exchange rate stability and uncertainty have substantial effects on bank efficiency, with notable differences between the impact on operational and investment efficiency and between developed (G7) and developing (E7) economies.

Bank performance is also assessed in terms of intermediation efficiency. Thus, Azolibe (2022) investigates the ability of the development of the intermediation process of the banking sector to stimulate economic growth in Nigeria over the period 1987 – 2018. The study used Johansen cointegration test, dynamic ordinary least squares regression and error correction model to determine the relationship between the variables. The results of the cointegration test confirmed the existence of a long-term relationship between banking sector development indicators and economic growth in Nigeria; while in the short term, only the number of bank branches and total bank assets have a positive and significant impact on economic growth.

Abdelmoneim & Yasser (2023) study the effect of economic growth on bank profitability in 8 middle-income countries in the Middle East and North Africa (MENA) region and in MINT countries using the generalised method of moments (GMM). Bank profitability is measured by return on assets (ROA), return on equity (ROE), net interest margin (NIM) using the CAMEL model. The results show a better performance for MINT countries than for MENA countries. In addition, the profitability of the MENA and MINT regions (ROA and ROE) is affected by GDP, which means that their economies are restructuring very well and their banking industries should develop quickly. Aziz (2020) empirically examines the impact of bank profitability on growth in Arab countries between 1985 and 2016. Using a generalized method of moments (GMM) the study reveals that both bank profitability variables are positively related to economic growth.

Klein & Weill (2022) provide a rigorous study of the influence of bank profitability on economic growth. Their investigation covers a panel of 132 countries over the period 1999-2013 using the Generalized Method of Moments (GMM) of dynamic panel techniques. The results reveal a positive impact of bank profitability on economic growth in both the short and long term. These results are robust to controlling for the dynamics of bank profits. They are also robust to other measures, specifications and time periods. Recently, Reddy et al. (2023) analyze the relationship between bank performance and GDP growth between 1990 and 2019. Using the ordinary least squares

method, the results indicate that domestic credit, return on equity and capital adequacy ratio, are positively correlated with India's GDP growth.

Contrary results are found by Petkovskia & Kjosevskib (2014). Investigating the influence of profitability on economic growth in 16 transition economies in Central and South-Eastern Europe, the authors find that credit to the private sector and the interest margin are negatively related to economic growth. In contrast, the quasi-money ratio is positively related to economic growth. Tan & Floros (2012) had found the same result earlier in the case of Chinese banks.

Silva et al. (2021) stress the importance of taking into account the origin of the credit, the ownership of the bank, the type of credit and the type of bank when investigating the relationship between banking and economic growth. At least this is what emerges from his study of the Brazilian banking sector. Indeed, credit granted to the corporate sector by domestic private banks is correlated with higher rates of economic growth, while credit granted by public banks and economic growth only become statistically significant after the crisis. Furthermore, credit not allocated to the business sector is associated with municipal economic growth more strongly than credit allocated to it, despite the increased relevance of the latter after the global financial crisis.

Kamarudin et al. (2024) focus on the income level of countries to explain the lack of convergence of results. To this end, they seek to identify the effects of regulatory efficiency and market openness in terms of economic freedom on bank productivity at three income levels: lower-middle, upper-middle and high-income economies. The study covers a sample of 15 countries at different income levels and uses the Malmquist Productivity Index (MPI) to estimate bank productivity. The results of estimating a static panel data model (panel with fixed and random effects) show that banks in high-income economies are more productive and have higher growth rates than those in high- or low-income economies. The next section is devoted to methodology.

2. Research Methodology

Situations in which past decisions have an impact on current behavior are ubiquitous in economics. This is all the more true as a bank's result is only calculated at the end of a period, and can therefore only influence the economy in the following period. This situation describes the dynamic nature of relationships between variables in the economy. In dynamic autoregressive models, LSDVs are inconsistent when T is fixed (see Nickell, 1981). Since this criticism, regressions based on instrumental variables and the generalized method of moments have been proposed in the econometric literature as an alternative to LSDV (Anderson and Hsiao, 1982; Arellano and Bond, 1991; Blundell and Bond, 1998). These models have served as the basis for numerous studies, such as those by Tan & Floros (2012), Petkovskia & Kjosevskib (2014), Aziz (2020) and Klein & Weill (2022), examining the relationship between bank profitability and economic growth. One of the weaknesses of the IV and GMM estimators is that their properties hold when N is large, so they can be severely biased and inaccurate in panel data with a small number of cross-sectional units.

This is often the case in most macro-panels, but also in micro-panels where heterogeneity problems force the researcher not to use all available information, but rather to select a sub-sample of individuals from the original panel to estimate the parameters of interest.

An alternative approach based on LSDV bias correction in dynamic panel data models has recently become popular in the econometric literature (Nickell, 1981; Kiviet, 1995; Judson & Owen, 1999; Bun & Kiviet, 2003). However, none of these procedures is feasible for unbalanced panels. Bruno (2005) extends the formulas of Bun & Kiviet (2003) to unbalanced panels with a strictly exogenous selection rule. The LSDV estimator is given by:

$$\delta_{LSDV} = (W'M_s W)^{-1} W'M_s y \tag{1}$$

$$\text{Où } M_s = S\{I - D(D'SD)^{-1}D'\} S$$

Is the symmetrical, idempotent matrix (NT x NT), eliminating individual means and selecting usable observations. The bias approximation terms for unbalanced panels are as follows:

$$c_1(\overline{T^{-1}}) = \sigma_\epsilon^2(\Pi)q_1 \tag{2}$$

$$c_2(N^{-1}\overline{T^{-1}}) = -\sigma_\epsilon^2\{\tau Q\overline{W}'\Pi M_s \overline{W} + \text{tr}(Q\overline{W}'\Pi M_s \overline{W})I_{k+1} + 2\sigma_\epsilon^2 q_{11} \text{tr}(\Pi'\Pi\Pi)I_{k+1}\}q_1$$

$$c_3(N^{-1}\overline{T^{-2}}) = \sigma_\epsilon^4 \text{tr}(\Pi)[2q_{11}Q\overline{W}'\Pi\Pi'\overline{W}q_1 + \{(q_1'\overline{W}'\Pi\Pi'\overline{W}q_1) + q_{11} \text{tr}(Q\overline{W}'\Pi\Pi'\overline{W}) + 2\text{tr}(\Pi'\Pi\Pi\Pi)q_{11}^2\}q_1]$$

$$Q = \{E(W'M_s W)\}^{-1} = \{\overline{W}'M_s \overline{W} + \sigma_\epsilon^2 \text{tr}(\Pi'\Pi)e_1 e_1'\}^{-1}; \overline{W} = E(W);$$

$$e_1 = (1, 0, \dots, 0) \text{ is a vector } (k \times 1)$$

$$q_1 = Q_{e1}; q_{11} = e_1'q_1; L_T \text{ is the matrix } (T \times T)$$

under unit lower diagonal and all other elements are equal to 0

$$L_T = I_N \otimes L_T; \Gamma_T = (I_T - \gamma L_T)^{-1}; \Gamma = I_N \otimes \Gamma_T;$$

and $\Pi = M_s L \Gamma$ in all balanced panels $S \equiv I_{NT}$, donc $M_s = I - D(D'D)^{-1}D'$.

The above terms reduce to those of Bun & Kiviet (2003) with increasing level of precision, the following three possible bias approximations:

$$B_1 = c_1(\overline{T^{-1}}); B_2 = B_1 + c_2(N^{-1}\overline{T^{-1}}); B_3 = B_2 + c_3(N^{-1}\overline{T^{-2}}) \tag{3}$$

Bias-corrected estimators can be obtained by subtracting the resulting bias approximation estimates, $\hat{\beta}_i$ from LSDV as follow:

$$LSDVC_i = LSDV - \hat{\beta}_i, i = 1, 2 \text{ et } 3 \tag{4}$$

Monte Carlo results show that all three versions of LSDVC are preferred for dynamic panel data models with small N . For these reasons we adopt this approach to examine the relationship between profitability and economic growth in WAEMU. We retain the following specification for this study as in Klein & Weill (2022):

$$Y_{i,t} = \alpha_i + \alpha_{1i}Y_{t-1} + \beta_{1i}PROFIT_{i,t} + \sum_{k=1}^k \gamma_k c_{controls_{kit}} + \varepsilon_{i,t} \tag{5}$$

where: $Y(i,t)$ represents the growth rate of GDP per capita, PROFIT represents bank profitability and takes into account banks' return on assets (ROA) and return on equity (ROE), controls : the various control variables, which are inflation (INF); trade openness (TRADE); political stability (POLSTAB); investment(INVEST) and public spending(GOVEXP) ε the error terms and $\alpha_i, \alpha_{1i}, \beta_{1i}, \gamma(k)$ and the coefficients to be estimated.

The study covers the period from 1996 to 2023 and covers 7 WAEMU countries, with the exception of Guinea-Bissau due to a lack of data. However, the data are not identical for all periods, which is what is known as unbalanced panel data. The variables (ROA) and (ROE) cover the period 1996-2020 and the variable POLSTAB the period 1996-2022 due to the edition of the databases. Table 1 describes the source of the data and the description of the variables is contained in the following table.

Table 1. Summary of study variables

Variables	Notation	Measurement	Sources
GDP per capita growth rate	CPIB	PIB par habitant	WDI
Bank profitability (ROA and ROE)	PROFIT	$ROA = \frac{\text{net income}}{\text{net assets}}$ $ROE = \frac{\text{net income}}{\text{Equity}}$	GFDD
Inflation	INF	Year-on-year consumer price index	WDI
Trade openness	TRADE	Average trade/GDP	WDI
Political stability	POLSTAB	Perception of political stability	WGI
Investment rate	INVEST	Gross fixed capital formation as % of GDP	WDI
Public spending	GOVEXP	Public expenditure as & of GDP	WDI

The descriptive analysis of the variables is shown in Table 2. Over our study period, the growth rate of GDP per capita represented the growth of the WAEMU zone. GDP growth averaged 6.83%, with a standard deviation of 0.42%. This growth rate reached a maximum of 7.85% and a minimum of 6.07%.

Table 2. Descriptive statistics of variables

Variables	Obs	Mean	Std. Dev.	Min	Max
CPIB	196	6.831121	0.4296073	6.072412	7.856863
ROA	182	1.670693	1.166796	-3.76906	9.98514
ROE	182	20.2952	11.36216	-13.6534	64.5622
INF	196	2.456737	2.886551	-3.233389	14.29024
TRADE	196	26.42908	5.43348	15.18412	40.49529
GOVEXP	196	13.58332	3.51426	7.786333	24.38959
POLSTAB	189	-5.049255	.7604302	-2.479409	1.144467

Source: Author, based on data from WDI (2020) and GFDD (2020)

Return on assets (ROA) and return on equity (ROE) averaged around 1.67% and 20.29% respectively over the period 1996-2020. ROA over this period peaked at 9.98%, while ROE peaked at around 64.56 during the study period.

3. Results and Discussion

The examination of the results begins with the unit root tests. In panel data econometrics, there are two generations of tests. In our case, the test based on the Breusch-Pagan (1980) Lagrange multiplier is chosen because of the superiority of the time dimension ($T=24$) over the weak individual dimension ($N=7$). The p-values of the test are (0.000) for ROA and ROE respectively, reflecting the presence of inter-individual dependence. Consequently, Pesaran's (2007) second-generation unit root test is used. Test results are shown in the table below.

Table 3. Pesaran (2007) unitroot test

Variables	Without trend		With trend	
	Zt-bar	p-value	Zt-bar	p-value
CPIB	-2.490***	0.006	-0.368	0.356
ROA	-3.618***	0.000	-3.068***	0.001
ROE	-2.895***	0.002	-2.821***	0.002
INF	-9.496***	0.000	-8.957***	0.000
TRADE	0.111	0.544	-1.972**	0.015
GOVEXP	-1.599*	0.055	-0.461	0.322
INVEST	-1.310*	0.095	-1.704**	0.044
POLSTAB	-1.803**	0.036	-1.289*	0.099

Note: (***) , (**) and (*) represent the respective significance levels of 1% 5% and 10%.

Source: Author, based on data from WDI (2020) and GFDD (2020)

The results of the stationarity test summarized in Table 3 show the acceptance of the null hypothesis, which confirms the absence of unit root for all variables with the test of Pesaran, (2007). We conclude that the variables are stationary if we take into account the two specifications (with trend and without trend).

3.1. Discussion of Estimation Results

Tables 4 and Table 5 summarize the results for each bank profitability proxy. The results for Arellano & Bond (1991) (AB) and Blundell & Bond (1998) (BB) are identical, but the coefficients for BB are higher than those for AB. AB and BB together remain higher than AH's results. Note here that the lagged variables of GDP per capita growth rate and asset returns are significant at the 1% level.

Table 4. Corrected LSDV result table (ROA)

Variables	AH		AB		BB	
	Coef.	P> z	Coef.	P> z	Coef.	P> z
L1.CPIB	0.192677***	0.000	0.645035***	0.000	0.738638***	0.000
ROA	0.0047838***	0.002	0.0109309***	0.000	0.0136254***	0.000
INF	0.0010024	0.319	0.0035898***	0.000	0.0031024***	0.001
TRADE	-0.0003753	0.921	-0.005126***	0.000	-0.003342***	0.000
GOVEXP	-0.0007062	0.860	-0.010253***	0.000	-0.007678***	0.000
INVEST	0.0000672***	0.075	0.0047511***	0.000	0.0044096***	0.000
POLSTAB	0.0239257	0.247	0.0623754***	0.000	0.0672057***	0.000

Note: AH: Anderson & Hsiao; AB: Arellano & Bond; BB: Blundell & Bond; (***), (**) and (*) represent the respective significance levels of 1% 5% and 10%.

Source: Author, based on data from WDI (2020) and GFDD (2020)

Bank profitability, made up of return on equity (ROE) and return on assets (ROA), has a positive and significant impact on economic growth. Indeed, by exerting an impact on financial stability, bank profitability can promote economic growth. This result confirms those of Klein & Weill (2022). There is a positive and significant relationship between inflation and bank profitability in the long term. Indeed, when prices are rising, commercial banks take advantage to improve their activities. When there is inflation, banks' interest rates rise, as do their interest margins. The higher interest margins generated by inflation allow banks to increase their profits (Courtière, 1976). As a result, economic growth is boosted.

Table 5. Corrected LSDV result table (ROE)

Variables	AH		AB		BB	
	Coef.	P> z	Coef.	P> z	Coef.	P> z
L1.CPIB	0.168387***	0.000	0.567551***	0.000	0.676518***	0.000
ROE	0.0003161*	0.070	0.0004471***	0.017	0.000611***	0.000
INF	0.0010607	0.376	0.0033592***	0.001	0.0031261***	0.000
TRADE	-0.0002193	0.970	-0.004486***	0.000	-0.002836***	0.000
GOVEXP	-0.0006321	0.920	-0.009154***	0.000	-0.007458***	0.000
INVEST	0.0002137*	0.051	0.003998***	0.000	0.0040274***	0.000
POLSTAB	0.0230027	0.457	0.056990***	0.000	0.064654***	0.000

Note: AH: Anderson & Hsiao; AB: Arellano & Bond; BB: Blundell & Bond; (***), (**) and (*) represent significance levels of 1% 5% and 10% respectively.

Source: Author, based on data from WDI (2020) and GFDD (2020)

In international trade theories, participation in trade is thought to stimulate economic growth. But in the case of our study, trade openness has a negative influence on economic growth. While paradoxical, the result is nevertheless in line with the work of Foster (2008) and Eriş & Ulaşan (2013).

Investment stimulates economic growth in our study. This result can be explained at two levels. At the microeconomic level, investment is the engine of the economic machine that enables entrepreneurs to gather the resources needed to produce goods and services. Rapid and sustainable growth is fostered by a favourable conjunction in which entrepreneurship and investment lead to an increase in productivity, which in turn authorises an increase in investment in the future. Increasing the production capacity of the private sector is not the only factor driving economic growth; it must also be accompanied by productivity gains resulting from the rationalisation and modernisation of the means of production. At the macroeconomic level, as a component of aggregate demand, investment stimulates growth independently of its initial use.

Political stability stimulates economic growth. This result is in line with the predictions of institutional economic theorists. Indeed, good quality institutions are a leverage for economic growth insofar as they affect the development policies put in place.

Public spending has a negative influence on economic growth. This result is contrary to the theoretical predictions of Keynesians who stipulate that public spending boosts the economy by increasing aggregate demand. One possible explanation is that most public spending in low-income countries is geared towards administrative expenditure. This probably explains Buthelezi's (2023) negative result for low-income states in South Africa.

Conclusion

Profitability is a company's ability to generate profits from its activities. Consequently, banks and other companies have common objectives for the smooth running of their business and for their financial autonomy. This study analyzed bank profitability and economic growth in WAEMU countries over the period 1996 to 2020. The corrected LSDV model is run on the two profitability measures (ROA and ROE), on inflation; trade openness, gross fixed capital formation; public spending, inflation and political stability in order to capture the effects on economic growth. The data used for this study come from WDI, GFDD and BCEAO (2020). The results obtained after estimation reveal that inflation, profitability (ROA and ROE), political stability and gross fixed capital formation positively influence economic growth. Trade openness and public spending on the other hand, have a negative effect on growth. These findings suggest that the union authorities need to strengthen the supervision of the banking sector to ensure that it remains profitable. Future studies could look at the channels through which bank profitability is transmitted to economic growth.

Credit Authorship Contribution Statement

Koffi, Mounoufié Valéry contributed to all aspects of this research. Specifically, the conceptualization, design of the study, methodology selection, data collection, and formal analysis were carried out by Koffi, Mounoufié Valéry. The research was conducted independently with no external funding.

Conflict of Interest Statement

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

References

- [1] Abdelmoneim, Z., & Yasser, M. (2023). The impact of bank performance and economic growth on bank profitability: CAMEL model application in middleincome countries. *Banks and Bank Systems*, 18(3), 205-220. [http://dx.doi.org/10.21511/bbs.18\(3\).2023.17](http://dx.doi.org/10.21511/bbs.18(3).2023.17)
- [2] Alam, M. S., Rabbani, M. R., Tausif, M. R., & Abey, J. (2021). Banks' performance and economic growth in India: A panel cointegration analysis. *Economies*, 9(1), 38. <https://doi.org/10.3390/economies9010038>.
- [3] Anderson, T. W., & Hsiao, C. (1982). Formulation and estimation of dynamic models using panel data. *Journal of Econometrics*, 18(1), 47-82. [https://doi.org/10.1016/0304-4076\(82\)90095-1](https://doi.org/10.1016/0304-4076(82)90095-1)
- [4] Arellano, M., & S. Bond (1991). Some testes of specification for panel data: Monte Carlo evidence and application to employment equation. *The Review of Economics Studies*, 58, 277-97. <https://doi.org/10.2307/2297968>
- [5] Aziz, O. G. (2020). Does bank profitability stimulate economic growth in the Arab region? *Review of Middle East Economics and Finance*, 16(2), 20190017. <https://doi.org/10.1515/rmeef-2019-0017>
- [6] Azolibe, B. C. (2022). Banking sector intermediation development and economic growth: Evidence from Nigeria. *Journal of African Business*, 23(3), 757-774. <https://doi.org/10.1080/15228916.2021.1926857>
- [7] Beck, T., Demirguc, K.A., & Maksimovic, V. (2004). Bank competition and access to finance: International evidence. *Journal of Money, Credit, and Banking*, 36(3), 627-648. <https://www.jstor.org/stable/3838958>
- [8] Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115-143. [https://doi.org/10.1016/S0304-4076\(98\)00009-8](https://doi.org/10.1016/S0304-4076(98)00009-8)
- [9] Bruno, G. S. (2005). Estimation and inference in dynamic unbalanced panel-data models with a small number of individuals. *The Stata Journal*, 5(4), 473-500. <https://doi.org/10.1177/1536867X0500500401>
- [10] Bun, M. J., & Kiviet, J. F. (2003). On the diminishing returns of higher-order terms in asymptotic expansions of bias. *Economics Letters*, 79(2), 145-152. [https://doi.org/10.1016/S0165-1765\(02\)00299-9](https://doi.org/10.1016/S0165-1765(02)00299-9)
- [11] Buthelezi, E. M. (2023). Impact of government expenditure on economic growth in different states in South Africa. *Cogent Economics & Finance*, 11(1). <https://doi.org/10.1080/23322039.2023.2209959>

- [12] De Bandt, O., Camara, B., Pessarossi, P., & Rose, M. (2017). Can better capitalised banks be more profitable? An analysis of large French banking groups before and after the financial crisis. *Economie et Statistique*, 494(1), 131-148. <https://doi.org/10.24187/ecostat.2017.494t.1922>
- [13] Eriş, M. N., & Ulaşan, B. (2013). Trade openness and economic growth: Bayesian model averaging estimate of cross-country growth regressions. *Economic Modelling*, 33, 867-883. <https://doi.org/10.1016/j.econmod.2013.05.014>
- [14] Foster, N. (2008). The impact of trade liberalisation on economic growth: Evidence from a quantile regression analysis. *Kyklos*, 61(4), 543-567. <https://doi.org/10.1111/j.1467-6435.2008.00417.x>
- [15] Goddard, J., Molyneux, P., & Wilson, J. (2004). Dynamique de la croissance et de la profitabilité dans le secteur bancaire. *Journal of Money, Credit, and Banking*, 36, 1069-1090. <https://doi.org/10.1353/mcb.2005.0015>
- [16] Gurley, J. G., & Shaw, E. S. (1955). Financial aspects of economic development. *The American Economic Review*, 45(4), 515-538. <https://www.jstor.org/stable/1811632>
- [17] Hesse, H., & Poghosyan, T. (2016). Oil Prices and Bank Profitability: Evidence from Major Oil-Exporting Countries in the Middle East and North Africa. In: Gevorkyan, A., Canuto, O. (eds) *Financial Deepening and Post-Crisis Development in Emerging Markets*. Palgrave Macmillan, New York. <https://doi.org/10.5089/9781451873672.001>
- [18] Judson, R. A., & Owen, A. L. (1999). Estimating dynamic panel data models: A guide for macroeconomists. *Economics Letters*, 65(1), 9-15. [https://doi.org/10.1016/S0165-1765\(99\)00130-5](https://doi.org/10.1016/S0165-1765(99)00130-5)
- [19] Kamarudin, F., Iqbal Hussain, H., Mohamad Anwar, N. A., Michalek, J., & Ahmad Razimi, M. S. (2024). Empirical evidence of the relationship between regulatory efficiency, market openness, and bank productivity in economies at different income levels: Evidence from selected Asian and MENA countries. *Oeconomia Copernicana*, 15(2), 507-561. <https://doi.org/10.24136/oc.2762>
- [20] Kanga, D., Murinde, V., & Soumaré, I. (2020). Capital, risk and profitability of WAEMU banks: Does bank ownership matter? *Journal of Banking & Finance*, 114, 105814. <https://doi.org/10.1016/j.jbankfin.2020.105814>
- [21] King, R. G., & Levine, R. (1993). *Financial intermediation and economic development*, Volume 15689. Cambridge: Cambridge University Press.
- [22] Kiviet, J. F. (1995). On bias, inconsistency, and efficiency of various estimators in dynamic panel data models. *Journal of Econometrics*, 68(1), 53-78. [https://doi.org/10.1016/0304-4076\(94\)01643-E](https://doi.org/10.1016/0304-4076(94)01643-E)
- [23] Klein, P. O., & Weill, L. (2022). Bank profitability and economic growth. *The Quarterly Review of Economics and Finance*, 84, 183-199. <https://doi.org/10.1016/j.qref.2022.01.009>
- [24] Laryea, E., Ntow-Gyamfi, M. & Alu, A. A. (2016). Nonperforming loans and bank profitability: Evidence from an emerging market. *African Journal of Economic and Management Studies*, 7(4), 462-481. <https://doi.org/10.1108/AJEMS-07-2015-0088>
- [25] McKinnon, R. (1973). *Money and Capital in Economic Development*, Brookings Institution, Washington, DC.
- [26] Mebounou, T. G. C., Karan, M. B., & Dannon, H. (2015). Liquidity and bank profitability in WAEMU zone: a panel data analysis. *Afro-Asian Journal of Finance and Accounting*, 5(2), 113-134. <https://doi.org/10.1504/AJFA.2015.069888>
- [27] Moussa et Hdidar (2019) Bank profitability and economic growth: evidence from Tunisia References, *European Journal of Economic and Financial Research*, 3(4), 81-96. <http://dx.doi.org/10.46827/ejefr.v0i0.601>
- [28] Nasim, A., Nasir, M. A., & Downing, G. (2024). Determinants of bank efficiency in developed (G7) and developing (E7) countries: role of regulatory and economic environment. *Review of Quantitative Finance and Accounting*, 1-38. <https://doi.org/10.1007/s11156-024-01272-6>
- [29] Nickell, S. (1981). Biases in dynamic models with fixed effects. *Econometrica*, 49, 1417-1426. <https://doi.org/10.2307/1911408>
- [30] Orebiyi, P. A., & Otolurin, G. E. (2021) Bank profitability and economic performance nexus in nigeria: a panel analysis. *Journal of Applied Financial Econometrics*, 2(2), 101-119. https://www.researchgate.net/publication/362058108_BANK_PROFITABILITY_AND_ECONOMIC_PERFORMANCE_NEXUS_IN_NIGERIA_A_PANEL_ANALYSIS
- [31] Pagano, M. (1993). Financial markets and growth: An overview. *European Economic Review*, 37(2-3), 613-622. [https://doi.org/10.1016/0014-2921\(93\)90051-B](https://doi.org/10.1016/0014-2921(93)90051-B)
- [32] Pesaran, M. H. (2007). A simple panel unit root test in the presence of cross-section dependence. *Journal of Applied Econometrics*, 22(2), 265-312. <https://doi.org/10.1002/jae.951>

- [33] Petersen, M. A., & Rajan, R. (1994). The benefits of lending relationships: Evidence from small business data. *The Journal of Finance*, 49(1) 3-37. <https://doi.org/10.1111/j.1540-6261.1994.tb04418.x>
- [34] Petersen, M. A., & Rajan, R. G. (1995). The effect of credit market competition on lending relationships. *The Quarterly Journal of Economics*, 110(2), 407-443. <https://doi.org/10.2307/2118445>
- [35] Petkovski, M., & J. Kjosevski. (2014). Does Banking Sector Development Promote Economic Growth? An empirical analysis for selected countries in Central and South Eastern Europe. *Economic Research*, 27, 55–66. <https://doi.org/10.1080/1331677X.2014.947107>
- [36] Reddy, K., Mubeen, S., Raju, K. H. H., Jalaja, V. & Basha, M., (2023). Does the Performance of Banking Sector Promote Economic Growth? A Time Series Analysis. *International Journal of Professional Business Review*, 8(6), 7. <https://doi.org/10.26668/businessreview/2023.v8i6.2128>
- [37] Schumpeter, J.A. (1911). *A Theory of Economic Development*, Harvard University Press, Cambridge , MA
- [38] Shaw, E.S. (1973). *Financial Deepening in Economic Development*, Oxford University Press, New York .
- [39] Silva, T. C., Tabak, B. M., & Laiz, M. T. (2021). The finance-growth nexus: The role of banks. *Economic Systems*, 45(1), 100762. <https://doi.org/10.1016/j.ecosys.2020.100762>.
- [40] Tan, Y., & Floros, C. (2012). Bank profitability and inflation: The case of China. *Journal of Economic Studies*, 39(6), 675-696. <https://doi.org/10.1108/01443581211274610>
- [41] Vives, X. (2010). *Information and Learning in Markets: The Impact of Market Microstructure*. Princeton University Press. <https://www.jstor.org/stable/j.ctt7tc3b.1>
- [42] Zeqiraj, V., Hammoudeh, S., Iskenderoglu, O., & Tiwari, A. K. (2020). Banking sector performance and economic growth: evidence from Southeast European countries. *Post-Communist Economies*, 32(2), 267-284. <https://doi.org/10.1080/14631377.2019.1640988>