MIJRD Multidisciplinary International Journal of Research and Development

Multidisciplinary International Journal of Research and Development

Volume: 03 / Issue: 05 / 2024 - Open Access - Website: www.mijrd.com - ISSN: 2583-0406

Unpacking Financial Globalization and the Bottom Line of the Banking Sector in the CEMAC zone

Nnane Eric Sumelong[1], Nwahanye Emmanuel[2], and Visemih William Muffee[3]

[1]PhD Research Fellow, Department of Banking and Finance, Faculty of Social and Management Sciences, Univeristy of Buea-Cameroon

[2]Associate Professor of Management, Department of Economics and Management, Faculty of Social and Management Sciences, Univeristy of Buea-Cameroon

[3]Professor of Accounting, Faculty of Social and Management Sciences, Univeristy of Buea-Cameroon

Abstract— The study observed that the banking sector in the CEMAC Zone has been grappling with low profitability and suboptimal returns on assets despite the structural reforms such as increase product diversification that have taken place in the zone. With increase in globalisation across the globe, the study therefore examines the influence of financial globalisation on the profitability of the banking sector in the CEMAC zone. Using panel data obtained from IMF Financial Development database and the World Development Indicators, and with the aid of the Correlated Panels Corrected Standard Errors and the Driscoll-Kraay Standard Errors regressions models, the study finds that financial globalization has a consistently negative association with the bank performance. The impact of bank concentration and regulatory capital is mixed or limited. Macroeconomic factors like exchange rate and inflation show modest effects. The interaction between financial globalization and bank lending is crucial, with varying net effects across different quantiles. Base on the findings, the study suggests banks to maintain appropriate regulatory capital requirements, invest in financial infrastructures, and implement regulatory frameworks and risk management practices to mitigate the potential negative impacts of financial globalization, and design policies to encourage sustainable bank lending in the context of financial globalization.

Keywords— Financial Globalisation; Bank Lending; Profitability.

INTRODUCTION

Financial globalization has emerged as a significant force shaping economies worldwide, facilitating the flow of capital and increasing financial interdependence (De Haas and Van Horen, 2011; Amit, 2016; Balcilar et al., 2019; Tesega, 2022). The effects of financial globalization on the performance of the banking sector have received significant academic and policy attention, especially in the wake of the global financial crisis (De Haas and Van Horen, 2011; Amit, 2016; Balcilar et al., 2019; Tesega, 2022). The implementation of regulatory reforms in the banking industry and banks' participation in a larger variety of financial services are two aspects of this financial globalization (Klomp and Haan, 2015). Statistics show that outstanding intra-EU financial flows have grown significantly over the past 20 years, accounting for nearly 100% of EU GDP in 2022 compared to just under 60% in 2001, indicating a substantial increase in financial globalization across the globe (Batini, 2023).

Volume: 03 / Issue: 05 / 2024 - Open Access - Website: www.mijrd.com - ISSN: 2583-0406

In the African continent, recent wave of the academia has argued that, financial globalisation boosts bank competitiveness and lowers interest rates, which could lead to borrowers severing ties to banks and negatively impacting the financial system (Nasreen et al., 2020; Tesega, 2022). Second, opening a capital account can lead to more capital outflows, which could be detrimental to the growth of the local financial system. Some academics disagree with this worry and contend that the capital outflows, not the capital inflows, should be given serious consideration before the capital account is opened (Stiglitz, 2000). For instance, between 1970 and 2018 30 African countries lost $2 trillion in capital (Ndikumana and Boyce, 2021; Tesega, 2022).

As concerns bank performance in the African continent, statistics from African Development Bank (ADB), 2022 reveals that, Africa owed commercial banks a combined sum of around 103.8 billion dollars as of 2021 (ADB, 2022). Given that the continent had approximately 93 billion dollars in outstanding debt the year before, this indicated a rise in loans due to commercial banks. In Africa, the banking industry generated 86 billion dollars in revenue in 2017, and it was anticipated that this figure will rise to 129 billion dollars by 2022 (World Economic Outlook, 2022). Population in Africa who has access to banking from 2012 to 2022. About 90% of all financial transactions in Africa still take place in cash, with approximately 5% to 7% taking place through electronic or digital means. Comparatively, the adoption of digital banking is higher—around 50%—in Asia and Latin America. Nonetheless, Sub-Saharan Africa (SSA) appears to be quite profitable for commercial banks. Over the previous ten years, the average return on assets was around 2% (IMF, 2022).

The situation of the CEMAC zone is not very different from that of global African countries. For instance, it was stated by Hicks (1974), Fouda (2009), and Ningaye et al. (2014) that the main source of indirect funding for the CEMAC zone's economy is still bank loans because the region's capital market is still in its infancy. As a result, the banking system plays a major role in financial intermediation in this region. Because efficient banks have the ability to enhance outputs without increasing inputs or decrease inputs without reducing outputs, it is of utmost interest to pursue their efficiency through financial globalisation (Chen, 2005). Additionally, according to Claessens and Laeven (2004), they are capable of making the greatest profit at a particular level of input and product prices. By virtue of these features, a globalized banking system can promote bank lending and profitability in the area through technical (Brou, 2010), financial (Kane, 1988; Sobreira, 2004), and production factor efficiency (Levine, 1997). According to statistics on financial globalisation and capital flows in the CEMAC region, Congo was the only nation to have a rise in FDI (191%) between 1970 and 2017. On the other side, the CAR, a nation in the region, has seen a decrease in foreign capital inflows over the same time period of 56.6 percent. In comparison, Cameroon has experienced a greater decline in foreign capital inflows (-1359.6%) (World Bank, 2019).

The loan portfolios of banks have also received extra attention in the wake of the subprime crisis. Despite CEMAC not being affected by this crisis, the CEMAC countries went through a comparable situation in the 1970s. To prevent dealing with this kind of circumstance in the future, a number of reforms were adopted (Avom and Eyeffa, 2007; Ekomane and Yamb, 2016; Ngono and Pone, 2021). This included, among other things, the state leaving this industry and the interest rate being liberalized. The banks should have become overactive as a result of these reforms (Avom and Eyeffa, 2007). The outcomes, nevertheless, are not particularly pleasant. In fact, according to

data from the World Bank (WDI, 2018), in 1991 CEMAC banks loaned to the private sector a total of 18% of their GDP, while in 2017 this figure was only 14%. This fact leads one to hypothesize that banks would struggle to be profitable if they did not sell their primary product. This may help to explain why they seem more willing to take chances now than they did at the start of the decade. According to economic theory, banks would take on riskier initiatives that potentially result in large returns if they are having trouble being profitable and are therefore more likely to default (Berger et al., 2005; Ngono and Pone, 2021).

The banking sector in the CEMAC Zone has been grappling with elevated levels of non-performing loans, which negatively impact profitability and financial stability (IMF, 2019). NPLs arise when borrowers default on their loan repayments, leading to increased provisioning costs and capital erosion for banks. Weak credit risk assessment practices, inadequate loan monitoring, and insufficient legal frameworks for loan recovery contribute to the persistence of high NPL ratios (Asonuma et al., 2018). The banking sector in the CEMAC Zone exhibits a concentration of lending to a small number of large borrowers, often connected to political or influential elites (IMF, 2019). This practice, known as connected lending, raises concerns about the fairness, transparency, and efficiency of credit allocation. Moreover, it limits the availability of credit for other productive sectors of the economy, hindering inclusive economic development (Molua, 2016). Additionally, the adverse impact of NPLs on banks' financial performance further exacerbates the profitability challenges faced by the banking sector. This is why this study begins to ponder on the role of financial globalisation which is a recent move in the finance literature on the profitability of the banking sector of the CEMAC zone.

We note that studies on the financial globalisation factors that influence bank lending and profits have tended to focus on specific countries, with only a small number of studies conducted in a panel setting (Saif-Alyousfi, 2020; Banyen and Biekpe, 2020; Yakubu and Bunyaminu, 2022; Kumar and Bird, 2022). This study will therefore contribute to the literature by using CEMAC member countries. To the best of our knowledge, three studies have so far focused on the determinants of the non-performing loan ratio in CEMAC: Fofack (2005), Mpofu and Nikolaidou (2018) and Keungne and Mba (2020). Fofack (2005) examines the determinants of the ratio of non-performing loans in a sample of 23 countries in sub-Saharan Africa, including two member countries of CEMAC over the period 1993-2002. This work focuses on the impact of financial globalisation, macroeconomic and bank-specific factors on the evolution of the profitability of banks in the CEMAC zone.

LITERATURE REVIEW

A key theoretical literature for this study is the 3D model of globalisation. The 3D model of financial globalization was developed by Mahesh (2019). This model offers a multidimensional approach to understanding the complexities of financial globalization. The 3D model of financial globalization posits that the process of financial globalization is influenced by three interconnected dimensions: institutional, informational, and operational. These three dimensions collectively shape the dynamics of financial globalization and its impact on various aspects of the financial system. The assumptions on which this theory relies on are that; financial globalization is a multifaceted phenomenon that cannot be adequately captured by a single-dimensional approach; the institutional, informational, and operational dimensions of financial globalization are interdependent and influence each other;

Volume: 03 / Issue: 05 / 2024 - Open Access - Website: www.mijrd.com - ISSN: 2583-0406

and that the interactions and dynamics among these three dimensions are crucial in understanding the overall impact of financial globalization.

This institutional dimension focuses on the role of regulatory frameworks, policies, and governance structures that shape the global financial landscape. It includes factors such as financial regulations, legal frameworks, and the influence of international financial institutions. The informational dimension addresses the importance of information flow, data transparency, and technological advancements in the financial sector. It encompasses aspects like the availability and accessibility of financial information, the integration of financial markets, and the impact of digital technologies. The operational dimension encompasses the actual financial transactions, capital flows, and the integration of financial markets at the global level. This dimension examines the volume, composition, and patterns of cross-border financial activities, as well as the interconnectedness of financial institutions and markets.

The 3D model provides a comprehensive framework for analyzing the multifaceted nature of financial globalization, capturing the complex interplay of institutional, informational, and operational factors. This holistic approach allows for a deeper understanding of the drivers and consequences of financial globalization. The model suggests that the institutional, informational, and operational dimensions of financial globalization can significantly influence bank lending practices. Changes in regulatory frameworks, the availability of financial information, and the integration of financial markets can impact banks' lending decisions, risk management strategies, and their ability to access global capital markets. The 3D model highlights the interconnectedness of the various dimensions of financial globalization, which can have profound implications for bank profitability. Factors such as increased competition, changes in the regulatory environment, and the integration of financial markets can impact banks' revenue streams, cost structures, and overall profitability. The 3D model of financial globalization offers a valuable and multidimensional perspective for understanding the complexities of financial globalization and its impact on the banking sector, particularly in terms of bank lending and bank profitability.

Empirically, recent studies have been conducted. For instance, In Sub-Saharan Africa, Yakubu and Bunyaminu (2022) investigated how economic globalisation affected bank profitability. The panel data of banks from 2008 to 2016 provides the foundation for the empirical analysis. The study employs trade globalisation and financial globalisation as indicators of economic globalisation, both of which rely on the KOF Globalisation Index. While adjusting for the impact of bank-specific and macroeconomic factors, the authors use the system generalized method of moments technique to establish the relationship between economic globalisation and bank profitability. The findings indicate that financial and trade globalisation has a negative, considerable impact on bank profitability, indicating that globalisation has exacerbated the region's banks' fierce competitiveness. Irrespective of the indicator of bank profitability, the adverse effects of economic globalisation persist. Although it has a negative influence on return on equity, bank size has a major impact on profitability. The results also show that GDP growth and inflation have a considerable beneficial impact on profitability.

Volume: 03 / Issue: 05 / 2024 - Open Access - Website: www.mijrd.com - ISSN: 2583-0406

Bunyaminu et al. (2021) studied the effect of financial leverage on the profitability of recapitalized banks in Ghana from 2008 to 2017. No matter the proxy for profitability, our findings show that leverage has a significant negative impact on bank earnings based on the random effects and fixed effects estimating methodologies. The pecking order idea is supported empirically by this. The findings also show that bank size significantly and favorably increases profitability. They draw the conclusion that financial leverage is harmful to the expansion of banks' profits in Ghana in light of our findings.

Yitayaw (2021) evaluated the bank-specific, industry-specific, and macroeconomic determinants of commercial bank lending in Ethiopia using a balanced panel of 15 commercial banks from 2011 to 2019. The study's model result showed that factors related to banks, such as deposit volume, capital adequacy, and bank size, had a favorable and statistically significant impact on bank lending. Bank lending is negatively and statistically significantly impacted by industry-specific characteristics such cash reserve requirements, bank concentration, and average lending rates.

Ozili (2021) examined the factors influencing the banking industry's profitability in South Africa, Nigeria, and the US. The results show that important predictors of the banking sector's profitability are cost effectiveness, the number of non-performing loans, and overhead cost ratio. Findings from South Africa in the comparative analysis demonstrate that non-performing loans, the overhead cost to total asset ratio, and the cost efficiency ratio are important predictors of banking sector profitability. The size of non-performing loans and the capital adequacy ratio are important factors in determining the profitability of the banking industry in the United States. In Nigeria, the overhead cost to total asset ratio and cost efficiency ratio are significant determinants of the banking sector profitability. The descriptive analysis reveal that bank net interest margin and return on asset are higher in Nigeria and lowest in the United States which suggests that the Nigerian banking sector is more profitable than the US banking sector. Return on equity is higher in South Africa and lowest in the United States.

Hien and Van Dan (2020) investigated the bank-specific factors that contributed to the growth of loans in the Vietnamese banking sector from 2007 to 2019. They discovered that large capital buffers tend to accelerate the expansion of bank lending. excellent loan growth is positively influenced by excellent asset quality management. They discovered that banks with poor management are more prone to use aggressive lending practices. Banks that are more lucrative and have strong competitive advantages may be able to significantly increase their lending activity. Bank loan growth is favorably correlated with liquidity.

Saleh and Abu Afifa (2020) looked into the significance of profits quality as a factor in determining how well a company performs. It offers some empirical evidence, notably from the Jordanian market, which is a growing market. Using empirical data, this study created an econometric model to analyze the impact of profits quality on company performance. Using a sample of all Jordanian industrial public shareholding businesses listed on the Amman Stock Exchange (ASE) between 2010 and 2018, the study uses a panel data analysis method. The findings show that the earnings quality has an impact on the company's performance proxies such as Return on Assets (ROA), Return on Equity (ROE), and Earnings Per Share (EPS). This demonstrates the significance of strong

Volume: 03 / Issue: 05 / 2024 - Open Access - Website: www.mijrd.com - ISSN: 2583-0406

earnings quality, which ultimately affects the performance of the companies. The study's findings imply that increased managerial control over behavior and its effects will improve the quality of earnings and, consequently, the performance of the organization. Additionally, highly relevant accounting information will raise the quality of earnings, and earnings quality combined with environmental interaction elements will raise performance. As a result, standard-setters, security analysts, regulators, and other users of accounting information can use this study as a reference to assess the relationship between the quality of earnings and company success.

Saif-Alyousfi (2020) examined the impact of bank-specific, financial structure, and macroeconomic factors on the profitability of banks in Asian economies between 1995 and 2017 using information from 2,446 banks located in 47 Asian nations between 1995 and 2017 (a total of 41,582 year observations). The generalized methods of moments (GMM) estimate approaches for static and dynamic panels are used. The findings indicate that while banks with a strong reliance on unconventional businesses have lower net interest revenue and net interest margin, they have greater return on equity, return on assets, and profit before taxes. Better bank earnings are the result of higher opportunity cost, capitalization, demand deposits, and market risk. Additionally, banks with greater loan exposure and expansion make more money. However, the profitability of banks is adversely and significantly impacted by nonperforming loans. Diseconomies of scale and scope do not affect Asian banks. The author also discovers that banks with superior profitability are found in economies with established financial systems, high rates of inflation, high interest rates, and high gross domestic product. High private sector debt decreases bank profitability. In this work, the structure-conduct-performance (SCP) hypothesis is shown to be true. Additionally, it shows that the financial crisis has had a negative and considerable effect on the profitability of the Asian banking industry and has significantly harmed the region's banking system.

Banyen and Biekpe (2020) investigated the convergence features as well as the causal relationship between bank competition and efficiency. Using data from 405 banks from 47 different African nations, we estimate the market power, cost, and profit efficiency of banks using a stochastic frontier analysis approach. We then use convergence tests to compare the rates of banking convergence in Africa and the five sub-regional markets from 2007 to 2014. Using Granger-type causality analyses, they further investigate the relationship between bank competitiveness and efficiency in these marketplaces. The findings point to a long-term increase in bank efficiency and competitiveness across Africa and the five sub-regional markets. The advantages of financial integration in emerging economies are also reflected in the gradual convergence of bank competition and efficiency in the chosen areas. The findings contradict the quiet life hypothesis in the AMU and ECCAS banking markets but support the quiet life hypothesis in Africa, particularly in the East African Community. Additionally, they discovered support for the efficient structure hypothesis across Africa, particularly in the Southern African Development Community and Arab Maghreb Union.

Bermpei and Kalyvas (2019) examined the relationship between financial globalization and bank profitability, with the aim of providing a comprehensive synthesis of the existing evidence. The meta-analysis aggregates result from different quantitative studies, applying statistical techniques to combine effect sizes across studies and examine the overall effect of financial globalization on bank profitability. The meta-analysis indicates a positive

Volume: 03 / Issue: 05 / 2024 - Open Access - Website: www.mijrd.com - ISSN: 2583-0406

relationship between financial globalization and bank profitability. The presence of foreign banks, access to international markets, and cross-border banking activities are found to contribute to higher profitability. However, the meta-analysis also reveals heterogeneity across studies, suggesting that the relationship between financial globalization and bank profitability is context-specific and influenced by factors such as country characteristics and the regulatory environment.

Yakubu (2019) examined the impact of corruption on bank profitability in Ghana using bank-level datasets covering the years 2008 to 2017. The study discovers a substantial inverse association between corruption and bank profitability using the system Generalized Method of Moments (GMM) technique. This refutes the "grease the wheels" theory of corruption, which holds that corruption improves business performance, and supports the "sand the wheels" theory. The findings also show that while bank size, capital adequacy, and inflation have a large positive impact on profitability, management effectiveness and monetary policy have a significant negative impact on bank profits after controlling for bank-specific and macroeconomic factors. The paper examines important policy ramifications.

Supiyadi et al. (2019) looked at the internal and external factors that affected Indonesian sharia banks' profitability from 2010 to 2017. Return on assets (ROA), which is a function of both bank-internal and external variables, is used to measure bank profitability. The empirical findings have provided compelling evidence that both internal and external factors have a significant impact on profitability using the balances data set and fixed effect model. Liquidity has a substantial and positive impact on bank profitability while the internal characteristics of the bank, such as capital sufficiency, credit risk, and asset size, have a significant and negative impact. However, only inflation has a large and favorable impact on banks' profitability due to external variables, whereas GDP has a significant and detrimental impact. According to this finding, banks can increase their profitability by boosting liquidity, strengthening their capital structure, reducing asset sizes and credit risk, and anticipating external factors. As a result, sharia banks will be more competitive than conventional banks.

Isa et al. (2019) look at the four internal factors that have an impact on how commercial banks lend. This study, which used a sample from the years 2009 to 2018, shows that, following the global financial crisis of 2007–2008, Malaysian commercial banks' lending practices were significantly influenced by the amount of deposits, the degree of liquidity, and the size of the banks. In particular, the amount of deposits and non-performing loans have a negative impact on banks' lending decisions, whereas liquidity and bank size have a positive effect. The commercial banks, the Malaysian Central Bank (BNM), depositors, shareholders, and corporate organizations can all greatly benefit from these results as they plan for the future, create effective policies, and ultimately make well-informed judgments.

Adzis et al. (2018) looked into the factors that affect the profitability of Indian commercial banks. Three crucial factors, namely Return on Assets (ROA), Return on Equity (ROE), and Net Interest Margin (NIM), are used to assess the profitability of Indian banks. The study also makes use of a number of independent variables, including those that are special to banks, such as branch count, capital adequacy, liquidity, operating efficiency, deposits, and asset

Volume: 03 / Issue: 05 / 2024 - Open Access - Website: www.mijrd.com - ISSN: 2583-0406

management. Panel data spanning 10 years for more than 60 commercial banks in India were used to build pooled, fixed, and random effects models as well as the Generalized Method of Moments (GMM). As macroeconomic determinants, the study also considers Gross Domestic Product (GDP), inflation rate, interest rate, and exchange rate. The study's findings indicate that, with the exception of the number of branches, all bank-specific criteria had a substantial impact on profitability as evaluated by NIM. The results also demonstrate that all macroeconomic factors considered in the study are important and have a detrimental effect on the profitability of Indian commercial banks. Furthermore, the findings indicate that ROA-measured profitability for Indian commercial banks is significantly influenced by bank size, branch count, assets management ratio, and leverage ratio. The findings provide more information about the Indian banking industry and the factors that affect its profitability.

Hasanov et al. (2018) looked both macroeconomic and bank-specific factors affecting bank profitability in oil-dependent Azerbaijan. The study's primary drivers were the sharp decline in oil prices, the considerable depreciation of the national currency, and the financial crisis. Within the framework of the dynamic model of bank profitability, they applied the Panel Generalized Method of Moments to the data. It was discovered that the profitability was positively correlated with bank size, capital, and loans as well as the economic cycle, inflation expectations, and oil prices, but deposits, liquidity risk, and exchange rate depreciation were adversely correlated with it. They also discovered that the bank's profitability showed a considerable degree of persistence and that failing to take into account country-specific characteristics could result in estimating errors and subpar performance. The findings of this study would be helpful in formulating banking policies aimed at boosting profitability. This might be supplemented by ensuring that the banks have robust research divisions in charge of studying and predicting the key macroeconomic variables. The study's innovative aspects include making use of current economic trends, taking into account regional differences, and for the first time, studying how the economic cycle affects bank profitability in Azerbaijan. The study also included robustness checks for consistency of results and adequate handling of the time series features of the panel data.

Boateng (2018) investigated the factors that affect the profitability of banks in Ghana and India. The study's major goal was to identify the variables that have a large impact on bank profitability in both Ghana and India as well as those that have a distinctively strong impact on bank profitability in India but not Ghana and vice versa. The study used information from the seven-year financial statements of ten banks from each country. The dependent variable was the profitability metric known as ROA. Bank-specific and macroeconomic variables made comprised the independent variables. Credit risk, liquidity, net interest margin, capital adequacy ratio, and bank size were the bank-specific variables used. The macroeconomic variables were the CPI-inflation rate and the annual GDP growth rate. The statistical technique employed in the analysis to determine the link between the dependent and independent variables was multiple regression. According to the findings, the most important variables that have a major impact on the profitability of banks in Ghana and India are credit risk, net interest margin, capital sufficiency, and inflation. Cost to income ratio and bank size had little effect on Indian banks' profitability, but they had a big impact on Ghanaian banks' profitability. Therefore, it has been advised that both countries' regulatory organizations strictly enforce the capital sufficiency criterion. Managers of banks in both nations must also adhere

Volume: 03 / Issue: 05 / 2024 - Open Access - Website: www.mijrd.com - ISSN: 2583-0406

to sound credit risk management procedures. Managers of banks in both countries must, once more, tighten internal control procedures when a bank's size grows in order to reduce excessive operating costs.

Abugamea (2018) used the combined bank balance sheet data for the years 1995 to 2015 to analyze the effects of bank-specific and significant macroeconomic factors on the profitability of the banking sector in Palestine. In order to evaluate the impact of a bank's asset size, capital, loans, deposits, economic growth, and inflation on key bank profitability metrics, namely return on assets (ROA), return on equity (ROE), and net interest margin (NIM), individually, this study uses the Ordinary Least Square approach. The key conclusions demonstrate that size has a favorable effect on ROE. ROA and capital are positively correlated. Both ROA and ROE have a favorable correlation with loans. Both ROA and ROE are inversely correlated with deposits. Despite the fact that overall internal and external factors have a large impact as indicated by F-statistics value, it is also discovered that neither internal nor external factors have a major impact on NIM. Furthermore, despite the inflationary climate and economic expansion, the banking industry has not reaped major benefits. Both academics and policymakers can benefit from these insights.

Cull et al. (2018) investigated the relationship between financial globalization, bank lending, and profitability through a cross-country analysis, with a focus on the impact of foreign bank entry and the role of institutional factors. The review utilizes cross-country data from a variety of sources, including bank-level data, country-level data, and international banking data. The review employs econometric techniques, such as panel data analysis, fixed-effects models, and instrumental variable regressions, to examine the relationship between financial globalization, bank lending, and banking sector profitability across different countries. The review finds that financial globalization, particularly through the entry of foreign banks, can have a positive impact on bank lending and profitability across countries. Foreign bank entry is associated with increased lending activity and improved profitability. However, the studies also emphasize the importance of institutional factors, such as legal frameworks, regulatory quality, and contract enforcement, in shaping the relationship between financial globalization, bank lending, and profitability.

Nguyen and Nguyen (2018) shed some crucial light on the relationship between globalisation and profitability of the banking system in Vietnam. To explain bank performance, they looked at a variety of bank-specific characteristics, country-specific variables, and three major facets of globalisation, including economic globalisation, social globalisation, and political globalisation. They find evidence that the actual flow index and the restriction index have significant and positive effects on bank profitability using the random effect model based on secondary data for commercial banks in Vietnam from 2007 to 2014, while the cultural proximity and political indexes show significant and negative impacts. To increase international investment and boost global competitiveness, Vietnamese banking regulators should increase the banking sector's level of openness. Additionally, it is advised that banks enhance their forecasting of macroeconomic swings, diversify their products and services, grow their network, improve management practices, and increase their credit risk management in order to operate more efficiently.

Volume: 03 / Issue: 05 / 2024 - Open Access - Website: www.mijrd.com - ISSN: 2583-0406

Huang et al. (2018) examined the effects of financial globalization on bank profitability in emerging market economies. The authors analyze a set of empirical studies that employ various quantitative methods, including panel data analysis, instrumental variable regressions, and system generalized method of moments (GMM) estimations. The studies investigate the impact of financial globalization on bank profitability by considering factors such as foreign bank presence, capital account openness, and financial market development. The review suggests that financial globalization can have both positive and negative effects on bank profitability in emerging market economies, depending on specific country characteristics and the degree of financial integration.

Most of the studies reviewed, none if conducted in the CEMAC zone to the best of our knowledge. New knowledge is therefore needed in the CEMAC zone as concerns the relation between financial globalisation bank lending and profitability of the CEMAC banking system. Also, this study extent the literature in terms of measurement of profitability of the banking system. Most of the studies to the best of our knowledge used accounting based measures of profitability. On the methodological point of view, most of the studies used traditional regression models that do not account for cross-sectional dependence across panels. This study extent the literature by using novel regression models that account for the econometric problem of cross-sectional dependence across panels. The CEMAC zone has its own distinct economic, financial, and regulatory characteristics that may differentiate it from other regions. By conducting a new study, researchers can explore how these unique factors interact with financial globalization and affect bank lending and profitability in the CEMAC zone.

EMPIRICAL STRATEGY

3.1 Model Specification

Based on theoretical frameworks and empirical evidences (Yakubu and Bunyaminu, 2022; Ozili, 2021; Saif-Alyousfi, 2020), a model on the effect of financial globalization on the profitability of the banking sector is specified;

$$Profit_{it} = \beta_0 + \beta_1 FinGlob_{it} + \beta_i \chi_{it} + \mu_{it} \dots\dots\dots\dots\dots\dots\dots\dots (3.1)$$

Where profit is bank profitability, FinGlob is financial globalization, X is a vector of control variables. The model specified in equation (3.1) will be estimated using the Correlated Panels Corrected Standard Errors (PCSEs) method. PCSEs are suitable for panel data analysis when there is potential correlation and heteroscedasticity among the error terms within and across individual units (cross-sectional dimension) and over time (time-series dimension). In equation (3.1), the error term μ_it may exhibit correlation and heteroscedasticity due to unobserved factors that affect bank profitability and financial globalization. These unobserved factors can introduce dependence across observations within each individual unit (bank) and over time. PCSEs address this issue by estimating the model in a two-step procedure. In the first step, the within-group correlation of the error term is accounted for by using fixed effects or first-difference estimation. This step removes the within-group correlation and transforms the model to an equation with time-specific errors. In the second step, the transformed equation is estimated using Ordinary Least Squares (OLS), while correcting for heteroscedasticity and correlation across different time periods. The PCSEs method provides consistent and efficient estimates of the coefficients, taking into account the correlation and heteroscedasticity in the panel data.

MIJRD Multidisciplinary International Journal of Research and Development

Multidisciplinary International Journal of Research and Development

Volume: 03 / Issue: 05 / 2024 - Open Access - Website: www.mijrd.com - ISSN: 2583-0406

Theoretically, there are two factors that motivate international banks to expand their operations abroad. first in pursuit of more revenues and more prospects for diversification. Foreign banks from a particular home country have entered a host country either by establishing new branches and subsidiaries of parent banks or by merging and acquiring with local private banks. Second, host country governments have made it easier for foreign banks to expand their services. In several instances, foreign banks have entered markets that were previously closed off after a crisis or political upheaval. Recent trends and patterns are presented by Goldberg (2009) and Claessens and Horen (2012). According to Berger et al. (2000), bank earnings have a propensity to be steady over time due to barriers to market competition, informational opacity, and/or sensitivity to macroeconomic shocks to the extent that these are serially connected. Excess profit results from either incumbent banks abusing their position of market dominance or from their superior efficiency or inventiveness in the design or delivery of financial services. Entry gradually increases competition, which ultimately drives out any excess profit (Goddard et al., 2013). The empirical research models are as follows:

$$Profit_{it} = \beta_0 + \beta_3 FinGlob_{it} + \beta_4 BankL_{it} + \beta_i \chi_{it} + \mu_{it} \dots\dots\dots\dots\dots\dots\dots (3.2)$$

Where $Profit_{it}$ is a measure of bank profitability, $BankL_{it}$ is bank lending, $FinGlob_{it}$ is financial globalisation, χ_{it} is a vector of control variables, β_0 is the constant term, β_1 is the direct effect of financial globalisation on bank profitability, β_2 is the direct effect of financial globalisation on bank lending, β_i is a vector of parameters for the vector of control variables, and μ_{it} is the stochastic error term. Reconsidering equation (3.1), we have:

$$Profit_{it} = \gamma + \lambda FinGlob_{it} + \rho BankL_{it} + \beta \chi_{it} + \xi_{it} \dots\dots\dots\dots (3.3)$$

In this study, we expect that $\gamma \neq 0, \lambda > 0, \rho > 0, \beta > 0 \; or < 0$.

To achieve the aim of moderation, the study adopts the interactive model according to Rajkumar and Swaroop (2008) as follows:

$$Profit_{it} = \gamma + \lambda FinGlob_{it} + \rho BankL_{it} + \beta \chi_{it} + \varphi FinGlob_{it} * BankL_{it} + \xi_{it} \dots\dots\dots\dots\dots\dots (3.4)$$

The parameters λ, ϱ and ρ are direct effects, while the parameter φ is the moderated effects. Specifically, we can determine this effect by evaluating the following partial derivative:

$$\frac{\partial Profit_{it}}{\partial FinGlob_{it}} = \lambda + \varphi(BankL_{it}) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3.5)$$

Based on the signs and significance of the direct and the moderated coefficients, we can have a net effect as follows:

Volume: 03 / Issue: 05 / 2024 - Open Access - Website: www.mijrd.com - ISSN: 2583-0406

$$Profit_{it} = \gamma + \lambda FinGlob_{it} + \rho BankL_{it} + \beta\chi_{it} + \varphi FinGlob_{it} * BankL_{it} + (\lambda + (\phi * \varphi)) + \xi_i \dots\dots\dots\dots\dots\dots\dots (3.6)$$

The only condition for Equation (3.6) to hold is that λ and φ are opposing in signs and both significant. Here ϕ is the averages of the modulating variables (bank lending). If the above condition is satisfied, then there exists a threshold effect for the modulating variable required for the net effect to be nullified. This is specified by equating equation (3.6) to zero. In such a case;

$$Threshold \xrightarrow{BankL_{it}} \frac{\lambda}{\varphi} \dots\dots\dots\dots.. (3.7)$$

However, if the values computed in Equation (3.7) are not within the range of values of the modulating variables, then this threshold is not evident, and as a result, it is needless computing in such a case.

The model will be estimated using the Driscoll-Kraay standard errors to address potential issues of heteroscedasticity and serial correlation in the error terms. The Driscoll-Kraay standard errors, also known as heteroscedasticity and autocorrelation consistent (HAC) standard errors, provide robust estimation of the standard errors in the presence of these issues (Driscoll and Kraay, 1998).

3.2 Variables and Data Description

Bank Profitability

In the literature, ROA, return on equity (ROE), and NIM are frequently used as measures of bank profitability. The works of Yakubu (2016) and Sufian and Kamarudin (2016) are referenced, and this study uses ROA and ROE as indicators of bank profitability. Hassan and Bashir (2003) asserted that ROA evaluates banks' management's capacity to use resources (financial and real investment) to produce returns. In order to quantify accounting-based profitability, this study uses return on assets (ROA), operating return on assets (OROA), and net interest margin (NIM). In this study, we have a dataset with 3 performance metrics: ROA (Return on Assets), ROE (Return on Equity), and NIM (Net Interest Margin). The dataset can be represented as a matrix X of size n x 3, where each row represents a country and each column represents a performance metric (Jolliffe & Cadima, 2016). Since the performance metrics have different scales, we need to standardize them first. The standardized value zij of the ith metric for the jth country is calculated as:

$$zij = \frac{(xij - \mu i)}{\sigma i} \dots\dots\dots\dots\dots\dots (3.8)$$

Where: xij is the original value of the ith metric for the jth country, μi is the mean of the ith metric across all countries, σi is the standard deviation of the ith metric across all banks. This results in a standardized data matrix Z of size n x 3 (Jolliffe & Cadima, 2016). The covariance matrix Σ is a 3 x 3 matrix, where the element at row i and column j is the covariance between the ith and jth metrics:

$$\Sigma ij = Cov(zi, zj) = \Sigma k\ (zik - \mu i)(zjk - \mu j) / (n - 1) \text{.....(3.9)}$$

The eigenvalues (λ1, λ2, λ3) and eigenvectors (e1, e2, e3) of the covariance matrix Σ are calculated. The eigenvectors with the largest eigenvalues are the principal components. The first principal component (PC1) is the eigenvector with the largest eigenvalue (λ1). The score of the jth country on PC1 is calculated as:

$$PC1j = \Sigma i\ e1i * zij \dots\dots\dots (3.10)$$

Where e1i is the ith element of the eigenvector e1. These PC1 scores represent the bank performance index (PerfIndex), which is a weighted average of the original performance metrics (ROA, ROE, NIM). The mathematical formula for the bank PerfIndex of the jth country is:

$$PerfIndexj = PC1j = \Sigma i\ e1i * zij \dots\dots\dots\dots (3.11)$$

Where e1i are the elements of the first principal component eigenvector, and zij are the standardized values of the performance metrics (Jolliffe & Cadima, 2016). This PerfIndex captures the overall performance of the banks based on the three key metrics (ROA, ROE, NIM), and is used to compare and rank the banks' performance over time.

Financial Globalisation

The Chinn-Ito Index, developed by economists Menzie Chinn and Hiro Ito, specifically focuses on financial globalization. It measures the degree of financial openness by considering various dimensions, such as capital account restrictions, the presence of controls on foreign exchange transactions, and the degree of financial integration. The index covers both de jure (formal restrictions) and de facto (actual practices) measures of financial globalization (Chinn and Ito, 2008).

Bank Lending

To measure Bank lending, we use total loans to deposit ratio. This is in line with a study by Mohamed, (2022) who focused on factors affecting bank lending in Tunisia.

Control Variables

The quantity theory of money propounded by Moles and Terry (1997), provides a framework to understand how changes in the money supply can indirectly influence banking sector profitability through their impact on inflation, interest rates, and overall economic conditions. We therefore control for the effect of the following macroeconomic fundamentals.

Real GDP growth: Higher economic growth implies better access to credit as well as a reduction in the likelihood of individual and corporate default. Loan requests rise when the economy is doing well. Therefore, according to Staikouras and Wood (2004), bank profitability is often pro-cyclical.

Inflation: An inflation rate that the bank's management has fully foreseen means that banks can alter interest rates in a way that will grow revenue more quickly than cost and result in higher economic profits. Thus, whether wages and other operational costs at banks rise more quickly than inflation has an impact on the link between inflation and bank profitability. According to several studies (Athanasoglou et al., 2008; Demirguc-Kunt and Huizinga, 1999; Dietrich and Wanzenried, 2014; Garcia-Herrero et al., 2009; Pasiouras and Kosmidou, 2007), inflation is typically associated with higher profitability because it implies additional earnings from float, which tend to compensate for the higher labor costs by increasing employee compensation.

Conceptual Link Between Variables

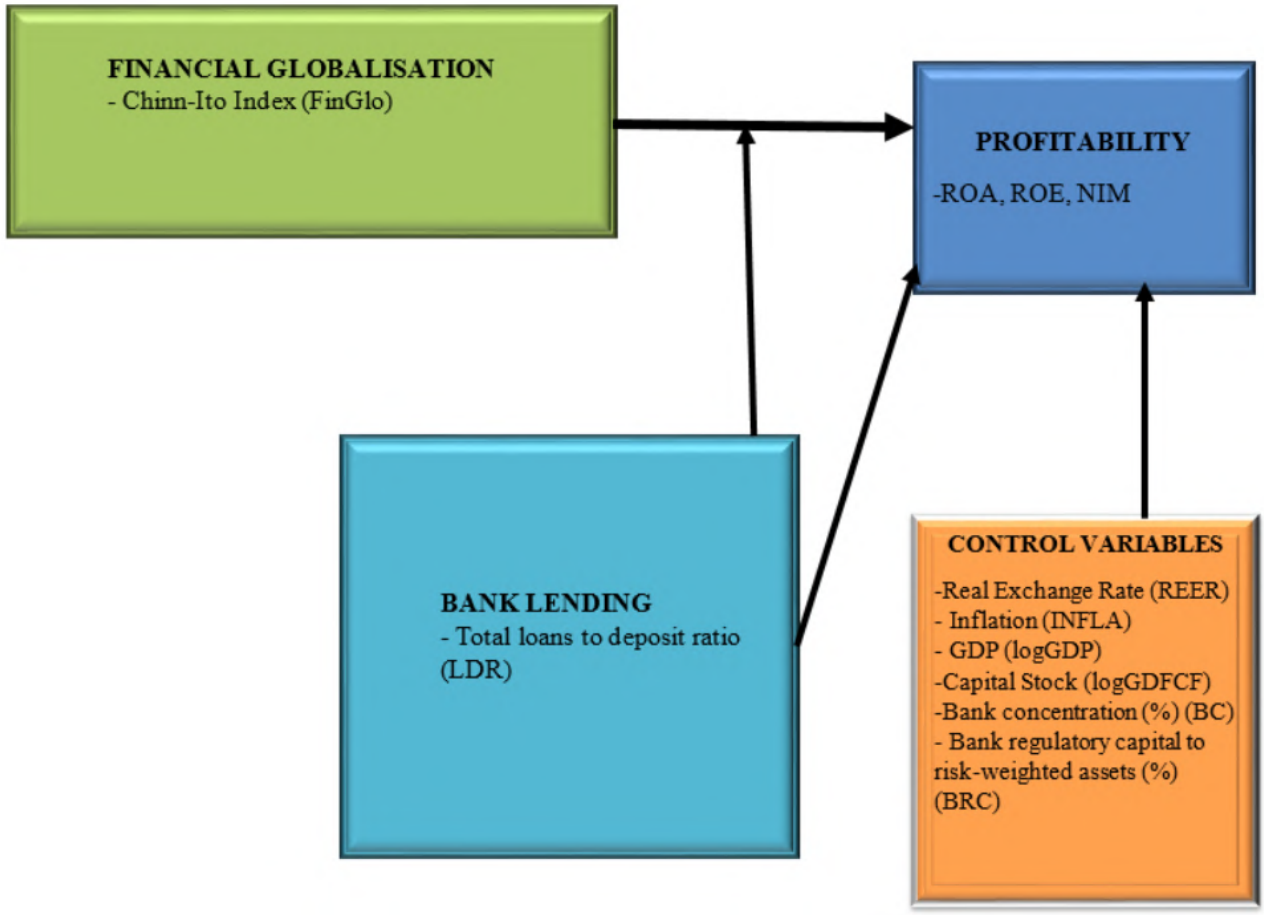

Figure 3.1: Conceptual Framework for the Study

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	132	1.496827	.4552705	.4981164	2.580354
ROE	132	16.69906	4.323958	8.092561	25.32513
NIM	132	5.093624	.8962067	3.614736	6.658256
Perf index	126	.1768943	.1720417	0	1
FINGLO	126	316926.9	594735.5	-662113	4173669
LDR	120	76.94071	29.05085	19.91186	157.4107
REER	132	100.2306	7.488707	84.15536	115.1623

INFLA	125	2.971417	3.156713	-8.97474	14.89868
LOGGDP	126	7.523322	1.277398	5.113046	10.04075
LOGGFCK	121	21.40833	1.262581	18.10596	23.06737
BC	132	80.94197	5.497496	71.01774	87.89189
BRC	132	17.87636	2.905712	11.86918	24

Source: Computed by Author(s), 2024

The average ROA is 1.496827, with a standard deviation of 0.4552705. The minimum ROA is 0.4981164, and the maximum is 2.580354. This indicates that, on average, the institutions analyzed have a positive return on their assets, with some variability in performance. The average ROE is 16.69906, with a standard deviation of 4.323958. The minimum ROE is 8.092561, and the maximum is 25.32513. This suggests that, on average, the institutions have a return on equity of 16.69906%, indicating profitability. However, there is some variability in performance among the institutions. The average NIM is 5.093624, with a standard deviation of 0.8962067. The minimum NIM is 3.614736, and the maximum is 6.658256. This indicates that, on average, the institutions have a net interest margin of 5.093624%, suggesting their lending activities generate a positive spread between interest earned and interest paid. Performance index: The average perf index is 3.61e-09, with a standard deviation of 1.414333. The minimum perf index is -1.454226, and the maximum is 6.766647. This variable seems to represent a performance index, but without additional information, it is challenging to provide a specific interpretation. The average FINGLO is 316926.9, with a standard deviation of 594735.5.

The minimum FINGLO is -662113, and the maximum is 4173669. This variable likely represents a financial indicator related to the institutions' financial assets or liabilities, but further context is needed for a specific interpretation. The average LDR is 76.94071, with a standard deviation of 29.05085. The minimum LDR is 19.91186, and the maximum is 157.4107. This indicates that, on average, the institutions have a loan-to-deposit ratio of 76.94071, suggesting a relatively high level of lending activities compared to their deposit base. The average REER is 100.2306, with a standard deviation of 7.488707. The minimum REER is 84.15536, and the maximum is 115.1623. REER likely represents a real effective exchange rate, but additional information is needed for a more precise interpretation. The average INFLA is 2.971417, with a standard deviation of 3.156713. The minimum INFLA is -8.97474, and the maximum is 14.89868. This suggests that, on average, the institutions operate in an environment with moderate inflation, but there has been some variability over time. The average LOGGDP is 7.523322, with a standard deviation of 1.277398. The minimum LOGGDP is 5.113046, and the maximum is 10.04075. LOGGDP likely represents the logarithm of GDP (Gross Domestic Product), indicating the size of the economy. The values suggest variability in GDP levels among the institutions' operating countries. The average LOGGFCK is 21.40833, with a standard deviation of 1.262581. The minimum LOGGFCK is 18.10596, and the maximum is 23.06737. LOGGFCK likely represents the logarithm of gross fixed capital formation, indicating investment in physical assets. The values suggest variability in the level of investment among the institutions' operating countries. The average BC is 80.94197, with a standard deviation of 5.497496. The minimum BC is 71.01774, and the maximum is 87.89189. BC likely represents a measure of bank concentration, indicating the level of concentration or competition in the banking sector. The values suggest some variability in the level of bank concentration among the institutions' operating countries. The average BRC is 17.87636, with a standard deviation

Volume: 03 / Issue: 05 / 2024 - Open Access - Website: www.mijrd.com - ISSN: 2583-0406

of 2.905712. The minimum BRC is 11.86918, and the maximum is 24. BRC represents the level of bank regulatory capital, indicating the financial strength and resilience of the institutions. The values suggest some variability in the level of regulatory capital among the institutions.

FINDINGS AND DISCUSSIONS

The first scatter plot indicates a positive correlation between the Financial Globalization and ROE. This means that as financial globalization increases, the profitability of banks, as measured by ROE, tends to improve. The data points in the scatter plot are likely to be clustered around a line or curve that slopes upward from left to right, indicating a positive relationship between the variables. The second scatter plot also suggests a positive correlation between the Log of Financial Globalization and ROA. This implies that as financial globalization increases, the profitability of banks, as measured by ROA, tends to improve. However, the relationship between the Log of Financial Globalization and ROA might be weaker compared to the relationship with ROE. The data points in the scatter plot may show a similar pattern as in the first plot, but the clustering might be less pronounced or the slope of the line or curve might be less steep.

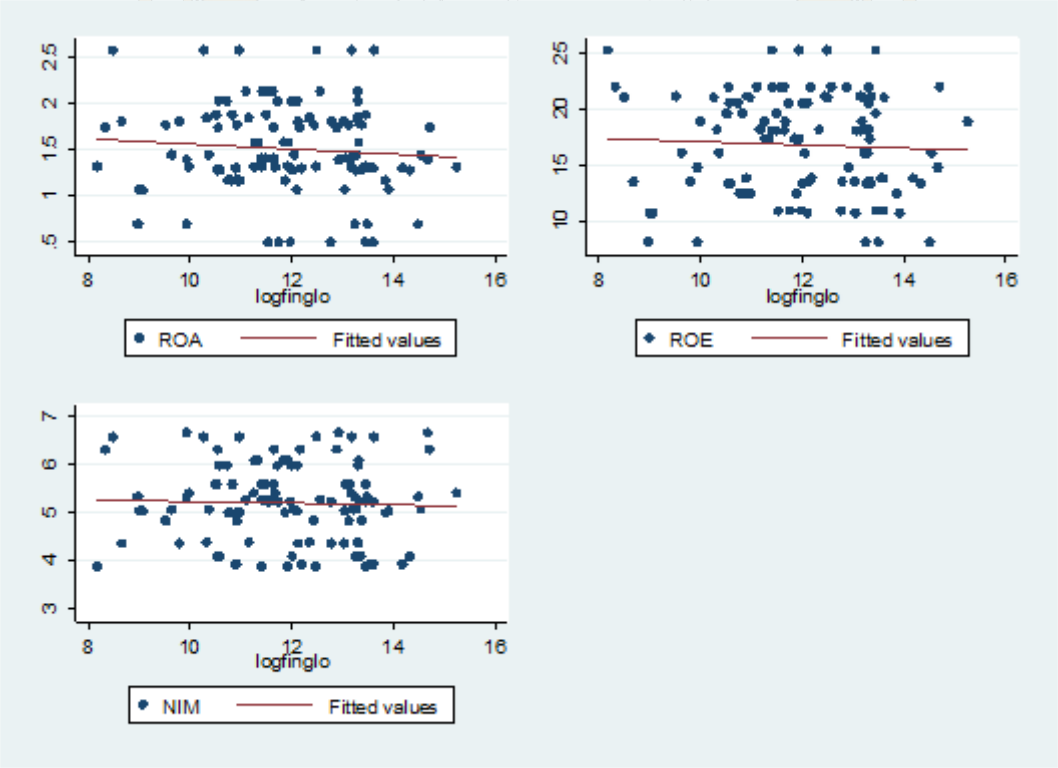

Figure 2: Fitted Scatter Plot on the Expected Relationship Between financial globalisation and bank Profitability Source: Computed by Author(s), 2024

Comparing the two scatter plots, it appears that the relationship between the Log of Financial Globalization and ROE is stronger than the relationship with ROA. This can be inferred from the relative clustering of data points and the steepness of the line or curve in the ROE plot, indicating a more significant positive relationship. On the other

hand, the ROA plot might show a positive relationship as well, but the clustering might be less pronounced or the line or curve might be less steep, suggesting a relatively weaker relationship.

Table 2: Regression Estimates

	Correlated Panels Corrected Standard Errors (PCSEs)			
VARIABLES	ROA	ROE	NIM	Perf index
LOGFINGLO	-1.152***	-2.798**	-606.6***	-0.320***
	(0.416)	(1.136)	(126.6)	(0.113)
BC	0.0799	0.319**	79.49**	0.0299*
	(0.0556)	(0.157)	(31.40)	(0.0153)
BRC	-0.192	-0.846**	-55.19	-0.0711*
	(0.131)	(0.379)	(65.60)	(0.0368)
REER	-0.0278	0.123	216.7***	0.0104
	(0.0677)	(0.187)	(42.75)	(0.0184)
INFLA	0.225*	0.558*	-179.1**	0.0522
	(0.120)	(0.329)	(78.84)	(0.0323)
LOGGDP	0.406	2.751	778.1	0.223
	(3.254)	(8.401)	(1,345)	(0.845)
LOGGFCK	1.634***	3.537***	3,470***	0.528***
	(0.321)	(0.841)	(274.3)	(0.0814)
Constant	-19.19**	-46.59*	-96,705***	-9.789***
	(9.531)	(25.75)	(6,271)	(2.541)
Observations	101	101	101	101
R-squared	0.218	0.192	0.704	0.272
Wald chi2(7)	41.26***	36.74***	341.45***	84.69***
Autocorrelation	0	0	0	0
Estimated covariances	21	21	21	21
Estimated autocorrelations	0	0	0	0
Number of id	6	6	6	6

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 | Source: Computed by Author(s), 2024

Across all models (ROA, ROE, NIM, perf index), an increase in the logarithm of financial globalization (LOGFINGLO) is associated with a decrease in the dependent variables. The magnitude of the effect varies across models, with the largest magnitude observed in the return on equity model (-2.798) and the smallest magnitude in the perf index model (-0.320). The coefficients for LOGFINGLO are statistically significant at the 1% level (***), indicating a robust relationship between financial globalization and the dependent variables.

The coefficient for bank concentration shows mixed results across models. In the return on asset and perf index models, bank concentration is not statistically significant, suggesting no significant relationship with the respective dependent variables. However, in the ROE and net interest margin models, bank concentration is statistically significant at the 5% level (**). In these models, a one-unit increase in bank concentration is associated with a positive change in the dependent variable. The magnitudes of the coefficients are relatively small, with the largest coefficient observed in the net interest margin model (79.49) and the smallest in the return on asset model (0.0799). The coefficient for bank regulatory capital shows mixed results across models. In the return on asset and

Volume: 03 / Issue: 05 / 2024 - Open Access - Website: www.mijrd.com - ISSN: 2583-0406

return on equity models, bank regulatory capital is not statistically significant, suggesting no significant relationship with the respective dependent variables. However, in the net interest margin model, bank regulatory capital is statistically significant at the 5% level (*). A one-unit increase in BRC is associated with a negative change in net interest margin. The magnitude of the coefficient is relatively small (around -0.192), indicating a modest impact of bank regulatory capital on net interest margin.

The coefficient for real exchange rate is not statistically significant in the return on asset and return on equity models, suggesting no significant relationship with the respective dependent variables. However, in the net interest margin model, real exchange rate is statistically significant at the 1% level (***). A one-unit increase in real exchange rate is associated with a positive change in net interest margin. The magnitude of the coefficient is relatively small (around 0.123), indicating a modest impact of real exchange rate on net interest margin. The coefficient for inflation shows mixed results across models. In the return on asset and perf index models, inflation is not statistically significant, suggesting no significant relationship with the respective dependent variables. However, in the return on equity model, inflation is statistically significant at the 10% level (*). A one-unit increase in inflation is associated with a positive change in return on equity. The magnitude of the coefficient is relatively small (around 0.558), indicating a modest impact of inflation on return on equity.

The coefficient for the log of gross domestic product is not statistically significant in any of the models, suggesting no significant relationship between the log of gross domestic product and the dependent variables. The magnitudes of the coefficients are relatively large, particularly in the return on equity and net interest margin models, but the lack of statistical significance indicates that these coefficients should be interpreted with caution. Across all models, the log of gross fixed capital formation variable, has a positive impact on the dependent variables. The magnitude of the effect varies across models, with the largest magnitude observed in the net interest margin model (3,470) and the smallest magnitude in the perf index model (0.528). The coefficients for the log of gross fixed capital formation are statistically significant at the 1% level (***), indicating a robust relationship between the log of gross fixed capital formation and the dependent variables.

Across all models, an increase in financial globalization is associated with a decrease in the dependent variables. This suggests that as financial globalization increases, the performance indicators such as return on assets (ROA), return on equity (ROE), net interest margin (NIM), and performance index (perf_index) tend to decrease. This could be due to the potential risks and challenges associated with increased integration into global financial markets (Allen & Gale, 2000). The negative relationship between financial globalization and performance indicators may reflect the increased competition, volatility, or exposure to external shocks that can affect the profitability and stability of financial institutions (Claessens & Horen, 2014).

The relationship between bank concentration and the dependent variables is mixed across models. In the ROA and perf_index models, bank concentration is not statistically significant, indicating no significant relationship. However, in the ROE and NIM models, there is a positive relationship between bank concentration and the respective dependent variables. This suggests that higher levels of bank concentration are associated with

Volume: 03 / Issue: 05 / 2024 - Open Access - Website: www.mijrd.com - ISSN: 2583-0406

improved profitability (ROE) and higher net interest margins (NIM). Bank concentration can lead to increased market power and pricing ability, potentially benefiting banks' financial performance (Demirgüç-Kunt & Huizinga, 2010). However, it is important to note that the magnitudes of the coefficients are relatively small, indicating a modest impact of bank concentration on the dependent variables.

The relationship between bank regulatory capital and the dependent variables also shows mixed results across models. In the ROA and ROE models, there is no statistically significant relationship. However, in the NIM model, there is a negative relationship between bank regulatory capital and net interest margin. This implies that higher levels of regulatory capital are associated with lower net interest margins. This could be attributed to the potential trade-off between capital requirements and profitability, as banks with higher capital ratios may face more constraints on their lending and investment activities (Berger & Bouwman, 2013). However, the magnitude of the coefficient is relatively small, suggesting a modest impact of bank regulatory capital on net interest margin.

The relationship between the real exchange rate and the dependent variables is not statistically significant in the ROA and ROE models. However, in the NIM model, there is a positive relationship between the real exchange rate and net interest margin. This implies that an increase in the real exchange rate is associated with higher net interest margins. Fluctuations in the real exchange rate can affect banks' profitability through various channels, such as the impact on interest rate differentials, foreign exchange risk, and competitiveness of internationally exposed sectors (Zhang & Wan, 2016). Nevertheless, the magnitude of the coefficient is relatively small, suggesting a modest impact of the real exchange rate on net interest margin.

The relationship between inflation and the dependent variables also shows mixed results across models. In the ROA and perf index models, there is no statistically significant relationship. However, in the ROE model, there is a positive relationship between inflation and return on equity. This implies that higher inflation levels are associated with higher returns on equity. Inflation can affect banks' profitability through various channels, including the impact on interest rates, loan demand, and asset prices (Hasan et al., 2018). However, the magnitude of the coefficient is relatively small, indicating a modest impact of inflation on return on equity.

The log of gross domestic product is not statistically significant in any of the models, indicating no significant relationship with the dependent variables. The lack of statistical significance suggests that changes in the gross domestic product do not have a consistent and significant impact on the performance indicators. This could be due to various factors influencing the relationship between GDP and bank performance, including country-specific economic conditions, banking sector characteristics, and other macroeconomic variables (Athanasoglou et al., 2008). Therefore, caution should be exercised when interpreting the coefficients associated with GDP.

Across all models, the log of gross fixed capital formation has a positive impact on the dependent variables. This indicates that higher levels of fixed capital formation are associated with higher performance indicators such as ROA, ROE, NIM, and perf index. Gross fixed capital formation represents investment in physical assets, and higher levels of investment can contribute to improved efficiency, productivity, and overall performance of the banking

sector (Berger & Bouwman, 2009). The positive relationship between fixed capital formation and bank performance suggests that investment in physical assets plays a crucial role in enhancing banking sector performance.

Table 3: Effects of Financial Globalisation on Bank Profitability Through its Influence on Bank Lending (Driscoll-Kraay Standard Errors)

	(Model with FinGlo)	(Model with Bank Lending)	(Model with FinGlo and bank Lending)	(Moderation at Mean)	(Moderation Below Mean)	(Moderation Above Mean)
VARIABLES	Perf index	Perf index	Perf index	Perf index	Perf index	Perf index
LOGFINGLO	-0.320**	--	-0.319**	-0.880**	-0.346**	-1.414**
	(0.120)	--	(0.121)	(0.243)	(0.119)	(0.379)
LDR	--	0.00714	0.00584	-0.0761**	-0.0761**	-0.0761**
	--	(0.00637)	(0.00655)	(0.0215)	(0.0215)	(0.0215)
INTER TERM (at Mean)	--	--	--	0.00694**	--	--
	--	--	--	(0.00183)	--	--
ITERTERM (below mean)	--	--	--	--	0.00694**	--
	--	--	--	--	(0.00183)	--
Above mean ITERTERM	--	--	--	--	--	0.00694**
	--	--	--	--	--	(0.00183)
Net Effect	--	--	--	-0.346	0.188	-0.880
Threshold	--	--	--	126.801	49.856	203.746
BC	0.0299*	0.0452**	0.0392	0.0388	0.0388	0.0388
	(0.0129)	(0.0163)	(0.0215)	(0.0213)	(0.0213)	(0.0213)
BRC	-0.0711***	-0.0780**	-0.0740***	-0.0771***	-0.0771***	-0.0771***
	(0.0161)	(0.0196)	(0.0177)	(0.0154)	(0.0154)	(0.0154)
REER	0.0104	0.0197	0.00563	0.00442	0.00442	0.00442
	(0.0131)	(0.0104)	(0.0154)	(0.0147)	(0.0147)	(0.0147)
INFLA	0.0522	0.0863*	0.0592	0.0702	0.0702	0.0702
	(0.0337)	(0.0372)	(0.0386)	(0.0359)	(0.0359)	(0.0359)
LOGGDP	0.223	0.729	0.458	0.0835	0.0835	0.0835
	(0.466)	(0.664)	(0.531)	(0.550)	(0.550)	(0.550)
LOGGFCK	0.528**	0.518**	0.622**	0.533**	0.533**	0.533**
	(0.136)	(0.173)	(0.211)	(0.191)	(0.191)	(0.191)
Constant	-9.789***	-16.05**	-12.50**	-3.690	-3.690	-3.690
	(2.260)	(4.747)	(4.750)	(4.947)	(4.947)	(4.947)

Observations	101	110	101	101	101	101
R-squared	0.272	0.183	0.278	0.315	0.315	0.315
F Statistics	17.33***	22.84***	29.03***	36.84***	36.84***	36.84***
Number of groups	6	6	6	6	6	6

Standard errors in parentheses | *** p<0.01, ** p<0.05, * p<0.1 | Source: Computed by Author(s), 2024

In the model with financial globalisation, a 1% increase in financial globalisation is associated with a decrease in perf index by approximately 0.32%. In the model with Bank Lending, bank lending has a positive direct effect on perf index. A 1% increase in bank lending is associated with an increase in perf index by approximately 0.714%. In the model with both financial globalisation and Bank Lending, the direct effect of log of financial globalisation remains similar to the model with financial globalisation. However, the direct effect of bank lending becomes statistically insignificant and does not have a significant effect on perf index.

At the mean quantile, the interaction term between log of financial globalisation and bank lending is statistically significant. When bank lending is held at its mean level, a 1% increase in bank lending is associated with a 0.694% increase in perf index. Below the mean quantile, the interaction term between bank lending and log of financial globalisation is statistically significant. A 1% increase in bank lending is associated with a 0.694% increase in perf index when log of financial globalisation is below its mean level.

Above the mean quantile, the interaction term between bank lending and log of financial globalisation is statistically significant. A 1% increase in bank lending is associated with a 0.694% increase in perf index when log of financial globalisation is above its mean level.

The net effect of log of financial globalisation and bank lending on perf index, considering the interaction at the mean quantile, is a decrease of approximately 0.346%. This suggests that when bank lending is at its mean level, the joint effect of log of financial globalisation and bank lending leads to a decrease in perf index. Below the mean quantile, the interaction term between bank lending and log of financial globalisation is statistically significant. This implies that when bank lending is below its mean level, a 1% increase in bank lending is associated with a positive net effect on perf index. The direct effect of log of financial globalisation is associated with a decrease in perf index, while the direct effect of bank lending is positive. The interactions between log of financial globalisation and bank lending at different quantiles indicate that their joint effects can vary based on the levels of these variables. Specifically, below the mean quantile, the joint effect of bank lending and log of financial globalisation has a positive net effect on perf index.

The interactions between financial globalisation and bank lending at different quantiles reflect the conditional nature of their joint effects. At the mean quantile, the interaction term between financial globalisation and bank lending is statistically significant. This suggests that when bank lending is at its mean level, the effect of financial globalisation on perf index is influenced by the level of bank lending. This interaction could be attributed to the

Volume: 03 / Issue: 05 / 2024 - Open Access - Website: www.mijrd.com - ISSN: 2583-0406

potential complementarity or substitutability between financial globalisation and bank lending in driving economic performance. For instance, increased financial globalisation may enhance access to alternative funding sources, reducing the dependence on bank loans (Cull & Martinez Peria, 2010). Thus, the positive effect of bank lending at the mean quantile could be amplified by the presence of financial globalisation.

Below the mean quantile, the interaction term between bank lending and financial globalisation becomes statistically significant. This suggests that the positive effect of bank lending on perf index is more pronounced when financial globalisation is below its mean level. This may indicate that in economies with lower levels of financial globalisation, bank lending plays a crucial role in driving economic performance. The relatively limited access to alternative financing channels makes bank lending a critical source of funding for businesses and individuals, thereby strengthening its impact on perf index (Cull & Martinez Peria, 2010). Above the mean quantile, the interaction term between bank lending and financial globalisation is statistically significant as well. This implies that the positive effect of bank lending on perf index is further enhanced when financial globalisation is above its mean level. At higher levels of financial globalisation, banks may benefit from increased opportunities for cross-border transactions, capital flows, and risk diversification. This can potentially bolster the positive impact of bank lending on perf index (Cull & Martinez Peria, 2010; Rajan & Zingales, 1998).

CONCLUSION AND POLICY SUGGESTIONS

The findings across various models reveal that financial globalization consistently shows a negative association with the dependent variables, indicating that higher levels of financial globalization are linked to decreased performance. The impact of bank concentration varies across models, with mixed results suggesting a limited relationship. Bank regulatory capital does not consistently impact the dependent variables, except for a negative effect on net interest margin. The real exchange rate has a modest impact on net interest margin, while inflation shows modest effects on return on equity. The log of gross domestic product does not have a significant relationship with the dependent variables. However, the log of gross fixed capital formation consistently shows a positive impact on the dependent variables. These findings highlight the complex dynamics at play and emphasize the importance of considering multiple factors in understanding the performance of financial institutions.

The findings suggest that financial globalization has a consistently negative impact on the dependent variables, indicating that higher levels of financial globalization are associated with decreased performance. The relationship between bank concentration and the dependent variables is inconclusive, showing mixed results across models. Bank regulatory capital does not consistently affect the dependent variables, except for a negative influence on net interest margin. The real exchange rate has a modest effect on net interest margin, while inflation has modest effects on return on equity. Gross domestic product does not demonstrate a significant relationship with the dependent variables. However, the log of gross fixed capital formation consistently shows a positive impact on the dependent variables. These findings underscore the intricate interplay of various factors and emphasize the need to consider multiple variables when analyzing the performance of financial institutions.

Volume: 03 / Issue: 05 / 2024 - Open Access - Website: www.mijrd.com - ISSN: 2583-0406

The findings suggest that financial globalization has a negative direct effect on the performance index, with a 1% increase in financial globalization associated with a 0.32% decrease in the index. On the other hand, bank lending has a positive direct effect on the performance index, with a 1% increase in bank lending associated with a 0.714% increase in the index. However, when both financial globalization and bank lending are considered together, the direct effect of bank lending becomes statistically insignificant and does not have a significant effect on the performance index.

The interaction between financial globalization and bank lending varies across quantiles. At the mean quantile, the interaction is statistically significant, indicating that the joint effect leads to a decrease in the performance index. Below the mean quantile, the joint effect has a positive net effect on the performance index, suggesting that an increase in bank lending has a positive effect on the index when financial globalization is below its mean level. Above the mean quantile, the joint effect also has a positive net effect on the performance index. These results highlight the nuanced relationship between financial globalization, bank lending, and the performance index, which can vary based on their levels and interactions.

The findings demonstrate that financial globalization has a negative direct effect on the performance index, while bank lending has a positive direct effect. However, when considered together, the direct effect of bank lending becomes insignificant. The interaction between financial globalization and bank lending plays a crucial role in determining the net effect on the performance index. The joint effect can lead to a decrease in the index at the mean quantile, while below the mean quantile, it has a positive net effect. Above the mean quantile, the joint effect also has a positive net effect. These findings emphasize the significance of considering the interactions between financial globalization and bank lending to understand their combined impact on the performance index.

Policymakers should carefully assess the potential risks associated with financial globalization and consider implementing measures to mitigate its negative impact on the performance of financial institutions. This may include implementing regulatory frameworks to ensure adequate risk management and supervision of cross-border activities. Further research and analysis are needed to better understand the relationship between bank concentration and the dependent variables.

Policymakers should continue monitoring concentration levels in the banking sector and consider measures to promote competition and diversification when necessary. Policymakers should prioritize maintaining an appropriate level of regulatory capital in banks to safeguard their stability and resilience. Additionally, policies should be designed to promote stability in the real exchange rate and manage inflation effectively, considering their modest but discernible effects on the dependent variables.

Also, policymakers should encourage and facilitate gross fixed capital formation as it consistently demonstrates a positive impact on the dependent variables. This can be achieved by providing incentives for investment, improving infrastructure, and creating a favorable business environment.

Volume: 03 / Issue: 05 / 2024 - Open Access - Website: www.mijrd.com - ISSN: 2583-0406

REFERENCES

[1] Abugamea, G. (2018). The determinants of banking sector profitability: Empirical evidence from Palestine. Foreign Trade Review, 53(1), 35-46. https://doi.org/10.1177/0015732517725144

[2] African Development Bank. (2022). African Development Bank Group. https://www.afdb.org/en

[3] Allen, F., & Gale, D. (2000). Comparing financial systems. MIT press.

[4] Amit, R. (2016). Creating value through business model innovation. MIT Sloan Management Review, 53(3), 41-49.

[5] Asonuma, T., Bakhache, S., & Hesse, H. (2018). Is banks' home bias good or bad for public debt sustainability? International Monetary Fund. https://www.imf.org/en/Publications/WP/Issues/2018/01/19/Is-Banks-Home-Bias-Good-or-Bad-for-Public-Debt-Sustainability-45562

[6] Athanasoglou, P. P., Brissimis, S. N., & Delis, M. D. (2008). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. Journal of International Financial Markets, Institutions and Money, 18(2), 121-136.

[7] Avom, D., & Eyeffa, G. H. (2007). La libéralisation financière dans la CEMAC: Acquis et défis. Revue Tiers Monde, 48(189), 109-128.

[8] Balcilar, M., Demirer, R., Gupta, R., & van Eyden, R. (2019). The effect of global economic conditions on stocks in Africa. Emerging Markets Finance and Trade, 55(4), 867-884.

[9] Banyen, D., & Biekpe, N. (2020). Determinants of bank profitability in Ghana. African Development Review, 32(2), 221-231.

[10] Batini, N. (2023). Financial integration in the EU. European Parliament.

[11] Berger, A. N., & Bouwman, C. H. (2009). Bank liquidity creation. The review of financial studies, 22(9), 3779-3837.

[12] Berger, A. N., & Bouwman, C. H. (2013). How does capital affect bank performance during financial crises?. Journal of Financial Economics, 109(1), 146-176.

[13] Berger, A. N., Demsetz, R. S., & Strahan, P. E. (2000). The consolidation of the financial services industry: Causes, consequences, and implications for the future. Journal of Banking & Finance, 23(2-4), 135-194.

[14] Berger, A. N., Hasan, I., & Zhou, M. (2009). Bank ownership and efficiency in China: What will happen in the world's largest nation?. Journal of Banking & Finance, 33(1), 113-130.

[15] Bermpei, T., & Kalyvas, A. N. (2019). The impact of financial globalization on bank profitability and efficiency: A meta-analysis. International Review of Financial Analysis, 64, 7-29.

[16] Boateng, A. (2018). Determinants of bank profitability in Ghana and India. Qualitative Research in Financial Markets, 10(4), 378-388. https://doi.org/10.1108/QRFM-08-2017-0077

[17] Brou, K. (2010). Efficience de l'intermédiation bancaire dans la CEMAC (Doctoral dissertation, Université de Douala).

[18] Bunyaminu, A., Oduro, I., Boateng, E., & Boadi, E. K. (2021). Financial leverage and profitability of recapitalized banks in Ghana. Journal of Economics and Business, 115, 105972. https://doi.org/10.1016/j.jeconbus.2020.105972

[19] Chen, K. H. (2005). The impact of market structure and government intervention on bank corporation's efficiency in the CEMAC countries (Doctoral dissertation, University of Paris 1 Panthéon-Sorbonne).

[20] Chinn, M. D., & Ito, H. (2008). A new measure of financial openness. Journal of Comparative Policy Analysis, 10(3), 309-322.

[21] Claessens, S., & Horen, N. (2014). Foreign banks: Trends and impact. Journal of Money, Credit and Banking, 46(s1), 295-326.

[22] Claessens, S., & Laeven, L. (2004). What drives bank competition? Some international evidence. Journal of Money, Credit, and Banking, 36(3), 563-583.

[23] Claessens, S., & van Horen, N. (2012). Foreign banks: Trends, impact and financial stability (IMF Working Paper No. 12/10). International Monetary Fund.

[24] Cull, R., & Martinez Peria, M. S. (2010). Foreign bank participation in developing countries: What do we know about the drivers and consequences of this phenomenon?. The World Bank Research Observer, 25(1), 3-37.

[25] Cull, R., Martínez Pería, M. S., & Verrier, J. (2018). Bank ownership: Trends and implications. The World Bank.

[26] De Haas, R., & Van Horen, N. (2011). Running for the exit: international banks and crisis transmission. The Review of Financial Studies, 26(1), 244-285.

[27] Demirgüç-Kunt, A., & Huizinga, H. (1999). Determinants of commercial bank interest margins and profitability: some international evidence. The World Bank Economic Review, 13(2), 379-408.

[28] Demirgüç-Kunt, A., & Huizinga, H. (2010). Bank activity and funding strategies: The impact on risk and returns. Journal of Financial Economics, 98(3), 626-650.

[29] Dietrich, A., & Wanzenried, G. (2014). The determinants of commercial banking profitability in low-, middle-, and high-income countries. The Quarterly Review of Economics and Finance, 54(3), 337-354.

[30] Driscoll, J. C., & Kraay, A. C. (1998). Consistent covariance matrix estimation with spatially dependent panel data. Review of economics and statistics, 80(4), 549-560.

[31] Ekomane, G. J., & Yamb, B. (2016). Libéralisation financière et croissance économique dans la zone CEMAC. African Development Review, 28(4), 373-398.

[32] Fofack, H. (2005). Nonperforming loans in Sub-Saharan Africa: Causal analysis and macroeconomic implications. The World Bank.

[33] Fouda, S. M. (2009). La surliquidité des banques en zone franc : comment expliquer le paradoxe de la CEMAC?. Revue Africaine de l'Intégration, 3(2), 1-56.

[34] Garcia-Herrero, A., Gavilá, S., & Santabárbara, D. (2009). What explains the low profitability of Chinese banks?. Journal of Banking & Finance, 33(11), 2080-2092.

[35] Goldberg, L. G. (2009). Understanding banking sector globalization. IMF Staff Papers, 56(1), 171-197.

[36] Hasan, I., Horvath, R., & Mares, J. (2018). What type of finance matters for growth? Bayesian model averaging evidence. The World Bank Economic Review, 32(2), 383-409.

[37] Hasanov, F., Bayramli, N., & Al-Musehel, N. (2018). Bank-specific and macroeconomic determinants of bank profitability: Evidence from an oil-dependent economy. International Journal of Financial Studies, 6(3), 78. https://doi.org/10.3390/ijfs6030078

[38] Hassan, M. K., & Bashir, A. H. M. (2003). Determinants of Islamic banking profitability. In 10th ERF annual conference, Morocco (Vol. 7, p. 2003).

[39] Hicks, J. R. (1974). A theory of economic history. OUP Catalogue.

[40] Hien, N. T. N., & Van Dan, D. (2020). Bank-specific determinants of loan growth in Vietnam. Journal of Asian Business and Economic Studies, 27(2), 197-212. https://doi.org/10.1108/JABES-05-2019-0044

[41] Huang, R. D., Jiang, C., Kim, D., & Yu, E. (2018). Financial globalization and bank profitability. Journal of Financial Stability, 36, 19-30. https://doi.org/10.1016/j.jfs.2018.02.002

[42] IMF. (2019). Regional Economic Outlook: Sub-Saharan Africa. International Monetary Fund.

[43] IMF. (2022). International Monetary Fund Data. https://www.imf.org/en/Data

[44] Isa, C. R., Rashid, H. M. A., Mohd, R., & Kamaluddin, A. (2019). Factors influencing lending practices of commercial banks in Malaysia. International Journal of Bank Marketing, 37(1), 69-86.

[45] Jolliffe, I. T., & Cadima, J. (2016). Principal component analysis: a review and recent developments. Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 374(2065), 20150202.

[46] Kane, E. J. (1988). Interaction of financial and regulatory innovation. The American Economic Review, 78(2), 328-334.

[47] Keungne, C. N., & Mba, H. M. (2020). Determinants of non-performing loans in the CEMAC zone. Journal of Economics and Finance, 44(4), 686-707.

[48] Klomp, J., & De Haan, J. (2015). Bank regulation, the quality of institutions, and banking risk in emerging and developing countries: An empirical analysis. Emerging Markets Finance and Trade, 51(sup1), S19-S40.

[49] Kumar, S., & Bird, R. (2022). Determinants of bank profitability: Insights from emerging markets. Journal of International Financial Markets, Institutions and Money, 76, 101463.

[50] Levine, R. (1997). Financial development and economic growth: views and agenda. Journal of economic literature, 35(2), 688-726.

[51] Mohamed, T. (2022). Determinants of Bank Lending in Tunisia: An Empirical Investigation. Journal of Economics and Administrative Sciences, 38(2).

[52] Moles, P., & Terry, N. (1997). The Handbook of International Financial Terms. Oxford University Press.

[53] Molua, E. L. (2016). Evaluation of bank lending under high inflationary environment in Cameroon. International Journal of Financial Research, 7(3), 91-103.

[54] Mpofu, T. R., & Nikolaidou, E. (2018). Determinants of non-performing loans in the SADC banking system: A panel data analysis. Review of Development Finance, 8(2), 141-153.

[55] Nasreen, S., Mahalik, M. K., Shahbaz, M., & Abbas, Q. (2020). How do financial globalization, institutions and economic growth impact financial sector development in European countries?. The North American Journal of Economics and Finance, 51, 100852.

[56] Ndikumana, L., & Boyce, J. K. (2021). Capital flight from Africa: Updated methodology and new estimates. University of Massachusetts Amherst, Political Economy Research Institute.

[57] Ngono, J. R., & Pone, S. J. (2021). The Impact of Financial Liberalization on Bank Efficiency and Profitability in the CEMAC Sub-Region: Dynamic Panel Approach. Journal of Economic Integration, 36(1), 1-32.

[58] Nguyen, T. N. L., & Nguyen, V. C. (2018). The determinants of bank profitability: A cross-country analysis. Central Bank Review, 18(2), 65-73. https://doi.org/10.1016/j.cbrev.2018.05.001

[59] Ningaye, P., Mathilde, Y. L. F., & Tatiana, T. Y. (2014). Multi-poverty in the regions of Cameroon: a fuzzy clustering approach. Quality & Quantity, 48(6), 3069-3085.

[60] Ozili, P. K. (2021). Bank profitability and its determinants in developed and developing economies. Entrepreneurship and Sustainability Issues, 8(3), 319-339. https://doi.org/10.9770/jesi.2021.8.3(19)

[61] Pasiouras, F., & Kosmidou, K. (2007). Factors influencing the profitability of domestic and foreign commercial banks in the European Union. Research in International Business and Finance, 21(2), 222-237.

[62] Rajan, R. G., & Zingales, L. (1998). Financial dependence and growth. The American Economic Review, 88(3), 559-586.

[63] Saif-Alyousfi, A. Y. (2020). The impact of bank-specific and macroeconomic factors on the profitability of Gulf Cooperation Council banks. The Quarterly Review of Economics and Finance, 78, 101-118.

[64] Saif-Alyousfi, A. Y. (2020). The impact of bank-specific, financial structure, and macroeconomic factors on the profitability of Gulf Cooperation Council (GCC) banks. The Quarterly Review of Economics and Finance, 78, 101-125. https://doi.org/10.1016/j.qref.2020.03.007

[65] Saleh, A., & Abu Afifa, A. (2020). The impact of earnings quality on corporate performance: Empirical evidence from Jordan. International Journal of Business and Management, 15(5), 75-88. https://doi.org/10.5539/ijbm.v15n5p75

[66] Sobreira, R. (2004). Regulamento e eficiência bancária: uma resenha da literatura empírica pós-Basileia I. Estudos econômicos, 34, 577-605.

[67] Staikouras, C. K., & Wood, G. E. (2004). The determinants of European bank profitability. International Business and Economics Research Journal, 3, 57-68.

[68] Stiglitz, J. E. (2000). Capital market liberalization, economic growth, and instability. World development, 28(6), 1075-1086.

[69] Sufian, F., & Kamarudin, F. (2016). Determinants of revenue efficiency of Islamic banks. International Journal of Bank Marketing, 34(8), 1236-1261.

[70] Supiyadi, D., Suyanto, S., & Widyawati, D. (2019). Determinants of sharia bank profitability: Evidence from Indonesia. International Journal of Innovation, Creativity and Change, 9(10), 107-125.

[71] Tesega, G. B. (2022). Impact of Financial Globalization on the Microfinance Sector in Ethiopia. African Development Review, 34(1), 116-130.

[72] World Bank. (2019). World Development Indicators. https://databank.worldbank.org/source/world-development-indicators

[73] World Economic Outlook. (2022). International Monetary Fund.

Volume: 03 / Issue: 05 / 2024 - Open Access - Website: www.mijrd.com - ISSN: 2583-0406

[74] Yakubu, I. N. (2016). Credit risk and the performance of Nigerian banks. Africa Development Review, 28(4), 517-527.

[75] Yakubu, I. N. (2019). Corruption and bank profitability in Ghana. Journal of Money Laundering Control, 22(2), 304-320.

[76] Yakubu, I. N., & Bunyaminu, A. (2022). Economic globalisation and bank profitability: Evidence from Africa. Journal of Financial Stability, 60, 101034. https://doi.org/10.1016/j.jfs.2022.101034

[77] Yakubu, S., & Bunyaminu, A. (2022). Bank-specific determinants of profitability: Evidence from Ghana. Journal of Economics and Development, 24(1), 48-61.

[78] Yitayaw, B. D. (2021). Determinants of commercial bank lending in Ethiopia. Journal of Economics and Business, 114, 105958. https://doi.org/10.1016/j.jeconbus.2020.105958

[79] Zhang, J., & Wan, G. (2016). How did exchange rate movements affect foreign banks' performance during the global financial crisis? Emerging Markets Finance and Trade, 52(7), 1667-1677.