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Quantifying the Link between Financial Development and Bank Profitability

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Abstract

This study seeks to examine the impact of financial development on bank profitability in Sub-Saharan Africa (SSA). We also investigate how institutional quality, bank stability, financial openness, and competition affect profitability. The researchers employ data from 33 countries covering from 2000 to 2017. Using the generalized method of moments (GMM) technique, the findings show that financial development exerts a negative significant effect on banking sector profitability. This result holds regardless of the indicator of profitability. This indicates that financial development dampens profitability in SSA. The study also reveals that institutional quality and bank stability positively and significantly influence profitability. We further observe that the impact of financial openness and competition on profitability significantly differs depending on the measure of profitability. The study discusses key implications for policy.

Keywords

Financial Development, Bank Profitability, Sub-Saharan Africa, GMM

1. Introduction

The development of the financial sector in both emerging and developing economies is a critical component of the private sector's strategy for stimulating economic growth and alleviating poverty. According to Ozili (2019), "financial development can be viewed in relation to the amount of transaction services

provided by the financial system, and the ability of the financial system to channel funds through banks from depositors to investors for investment purposes". Over the years, the impact of financial sector development on different facets of the economy has been examined in the literature, particularly how it affects economic growth. Financial development and growth relationship have been extensively studied, with results revealing a strong positive correlation and sometimes negative relationship between growth and financial sector development. For instance, Bist (2018) shows a positive impact of financial development on economic growth in African and non-African low-income countries. Siddik et al. (2019) report that financial permeation has a positive impact on economic growth in Asian economies. Puatwoe & Piabuo (2017) indicate that financial development positively and significantly influences economic growth in Cameroon. Appiah-Otoo & Song (2022) however find that financial development has a significant negative effect on Ghana's economic growth in the long-run. Aside from the economic growth impact of financial development, De Haan et al. (2021) posit that financial development leads to greater inequality, which, in turn, results in more poverty.

Despite the vast literature on the impact of financial development on growth and other aspects of the economy, a key area that has received little attention is the influence of financial development on banking sector activities, especially how it affects banks' profit growth, particularly in developing countries.

The determinants of bank profitability have garnered considerable research attention in the banking literature. The literature has extensively investigated the impact of bank-specific and macroeconomic factors on profitability (Yakubu, 2016; Al-Homaidi et al., 2018; Ercegovac et al., 2020; Zerihun, 2021; O'Connell, 2022; Haddad et al., 2022). Nonetheless, there is no consensus on the key factors affecting bank profit growth. Hence, the need for further research efforts. Also, studies on bank profit determinants have been skewed toward individual country level with only a few researches in a panel context (Saif-Alyousfi, 2020; Banyen & Biekpe, 2020; Yakubu & Bunyaminu, 2022; Kumar & Bird, 2022). This study seeks to advance the research on the drivers of bank profitability by examining the impact of financial sector development on profitability. The financial development-bank profitability nexus seems to escape the attention of researchers as there is scanty evidence on this (Ting, 2017; Ozili & Ndah, 2021). Also, in measuring financial development, prior studies have mostly dwelled on single proxies which do not actually reflect the overall financial sector activities. Thus, results from such studies could be biased and misleading. This study will employ an index of financial development based on key broad areas of financial sector activities. Additionally, the literature has virtually ignored the impact of institutional factors on bank performance. The study, therefore, aims to advance the research on the link between institutional quality and bank profitability.

The study contributes significantly to both literature and policy. For literature,

the study adds to the very scanty empirical research on the link between financial development and bank profitability, especially in the panel context. Second, the study presents an initial attempt to examine the impact of financial development on bank profitability in Sub-Saharan Africa using an index of financial development. Also, the paper adds to the few studies that have looked at the institutional quality and bank profitability relationship. For policymakers, examining how financial development affects banking sector profitability will help in policy formulation, especially on how to moderate the various components of financial development to increase banks' efficiency in Sub-Saharan Africa.

The rest of the paper is organized as follows: Section 2 provides a review of the literature while Section 3 discusses the research methodology. Section 4 presents the empirical findings and Section 5 concludes the study with some policy implications.

2. Literature Review and Hypotheses

One of the cardinal issues in the banking industry for business enhancement, bank solidity, and economic growth is bank profitability. Prior empirical studies in banking research present different measures of profitability such as return on equity, return on asset, non-interest income, equity per share, net interest margin, etc. (Lee & Hsieh, 2013; Ozili & Uadiale, 2017; Bunyaminu et al., 2022; Yakubu & Bunyaminu, 2022). As documented in the literature, several factors affect bank profitability. For instance, Oino (2015) carried out research on the determinants of bank profitability in Sub-Saharan Africa within the period 2000 to 2012. The findings of the study indicate that both the cost-to-income ratio and capital ratio have a negative effect on bank profitability. The findings further reveal that the highly diversified a bank is, the higher its profitability. Yakubu (2016) documents that bank size, liquidity, and expense management significantly drive bank profitability in Ghana. Ozili (2017) conducts a study on bank profitability determinants in Africa. The outcome of the study reveals that the key determinants of bank profitability of listed banks in Africa include bank size, total regulatory capital, and loan loss provisions. The findings further note that regulatory capital has a positive and significant impact on bank profitability of listed banks while higher regulatory capital thresholds have a negative impact on the profitability of non-listed banks. Anarfo & Appiahene (2017) explore the determinants of bank profitability by looking at the impact of capital structure on the profitability of 37 Sub-Saharan African banks. The outcome of the study reveals that banks' capital structure, bank size, tangible assets, and interest rate are significant determinants of bank profitability in Sub-Saharan Africa. Zheng et al. (2017) investigate the impact of bank capital requirements on the cost of financial intermediation and bank profitability. The study used 32 banks in Bangladesh ranging the period of 2000 to 2015. The outcome of their study reveals that a higher bank regulatory capital ratio and higher cost efficiency ratio decrease the cost of financial intermediation and upturn bank profitability. Their findings

are similar when they used the equity to total asset ratio as a substitute measure of bank capital. Borio et al. (2017) examine the effect of monetary policy on bank profitability by employing 109 multinational banks located in 14 major advanced economies within the period 1995 to 2012. The results of their analysis indicate a positive relationship between short-term interest rates and the interest rate structure and return on assets. Topak & Talu (2017) examine the determinants of bank profitability in Turkey over the period 2005-2015. The study shows that while the ratio of net fees and commission revenues to total operating expenses, the relative size of banks, real GDP, and interest rate positively drive bank profitability, the effect of credit risk, capital adequacy, and exchange rate on profitability is negative. In a comparative analysis, Boateng (2018) examines the factors that affect the profitability of banks in Ghana and India. The findings indicate that credit risk, capital adequacy, and inflation have a significant effect on profitability in both Ghana and India. Cost to income ratio and bank size, on the other hand, have an insignificant influence on the profitability of Indian banks, while they significantly affect the profitability of banks in Ghana. Abugamea (2018) investigates the effect of bank-specific and macroeconomic variables on bank profitability in Pakistan for the years 1995 to 2015. The author finds that at the bank-specific level, bank size, capital, and loans have a positive effect on profitability whereas bank deposits are related negatively with bank profit. For the macroeconomic factors, inflation and economic growth show a negative impact on profitability. Using the fixed effects technique, Supiyadi et al. (2019) investigate the internal and external factors that influence Indonesian sharia banks' profitability from 2010 to 2017. Internally, the study establishes that bank asset size, credit risk, and capital adequacy have a negative significant effect on profitability. Liquidity on the other hand positively and significantly affects bank profit. For the external factors, while the impact of inflation on profitability is positive and significant, GDP negatively drives profitability though significantly. Yakubu (2019) assesses the effect of corruption on bank profitability in Ghana over the period 2008-2017. Applying the generalized method of moments (GMM) technique with different measures of bank profitability, the paper establishes that corruption decreases profit growth in Ghana. In addition, the study finds that capital adequacy, the size of banks, and inflation positively affect profitability. The author further notes that monetary policy rate and the efficiency of bank managers significantly reduce the level of profitability of banks in Ghana. Saif-Alyousfi (2020) investigates the profitability of banks in Asia with data covering the period 1995-2017. Applying the static and dynamic panel generalized methods of moments (GMM) estimation techniques, the study finds a positive effect of capitalization, demand deposits, and market risk on bank profitability. The author also shows that inflation rates and high rates of interest in financially developed economies have higher profits. Banyen & Biekpe (2020) conduct a study on the effect of financial integration on bank profitability using a selected number of five regional economic communities in Africa. The study investigated

405 banks operating in 47 African countries from the period of 2007 to 2014. The findings of the study reveal a positive relationship between financial integration and bank profitability in Africa, with the exception of the Arab Maghreb Union and the Southern Africa Development Community. Ozili (2021) examines the factors influencing bank profitability in South Africa, Nigeria, and the United States. The outcome of the research indicates that cost efficiency, the size of non-performing loans, and overhead cost to total asset ratio are significant factors driving bank profitability. Situating the study within each country-specific, South African banks' cost-efficiency ratio, the overhead cost to total asset ratio, and non-performing loans are significant factors affecting bank profitability. Similarly, the United States banks' capital adequacy ratio and the size of non-performing loans are significant factors influencing bank profitability. At the same time, Nigerian banks' overhead cost to total asset ratio and cost efficiency ratio are significant determining factors of bank profitability. Bunyaminu et al. (2021) investigate the effect of financial leverage on the profitability of recapitalized banks in Ghana using bank-level data covering the years 2008-2017. Employing the random effects and fixed effects techniques, the study documents that leverage has a negative significant impact on bank profitability. The findings also reveal that bank size and profitability are positively and significantly related. Using an index of financial inclusion, Yakubu & Musah (2022) find that bank profitability is negatively driven by financial inclusion in a sample of Sub-Saharan African countries. They also reveal a direct effect of bank stability and inflation on profitability. In investigating the drivers of bank profitability in India and China, Kumar & Bird (2022) find that cost management, bank size, and credit quality are the key factors influencing profitability. They report that while loan to deposit ratio positively impacts profitability in China, it negatively influences bank profitability in India. Yakubu & Bunyaminu (2022) employ the GMM technique to examine the effect of economic globalization on bank profitability in Sub-Saharan Africa. The results show that economic globalization (in terms of trade and financial globalization) negatively and significantly influences the profitability of banks in the region. The study also establishes a positive and significant effect of GDP growth and inflation on bank profit.

For the effect of financial development, Ozili & Ndah (2021) find that there is a negative relationship between financial system deposits to GDP ratio (a measure of financial development) and the profitability of banks in Nigeria. Ting (2017) demonstrates that financial development when measured by the size of the banking sector has a positive effect on profitability. However, using financial liberalization as a metric of financial development, profitability decreases.

From the literature review, bank profitability is influenced by a number of factors, which are specifically classified as bank-level and macroeconomic variables. There is, however, a paucity of research on how financial development impacts bank profitability. As a result, our study will add to the extremely little research on the relationship between financial development and bank profitabil-

ity in Sub-Saharan Africa. Accordingly, we posit the following hypotheses:

Hypothesis 1: *A bank's lagged past profitability* (*a proxy for endogenous factors*) *affects current profitability*, *which in turn impacts the financial development-profitability relationship.*

Hypothesis 2: *Financial development will improve the profitability of banks in Sub-Saharan Africa*.

Hypothesis 3: *Institutional quality*, *bank stability*, *financial openness*, *and competition are likely to have a positive impact on the profitability of banks in Sub-Saharan Africa.*

3. Research Methodology

3.1. Data and Description of Variables

The authors employ panel data covering from 2000 to 2017 for 33 countries in Sub-Saharan Africa. The study seeks to empirically examine the impact of financial development on bank profitability. Hence, the dependent variable is bank profitability. We measure bank profit using return on asset (ROA), return on equity (ROE), and net interest margin (NIM). By definition, return on assets refers to the ratio of net income to total assets. Return on equity is the ratio of net income to shareholders' equity while net income is the ratio of net interest to total assets. The main independent variables are financial development and institutional quality whereas bank stability, financial openness, and competition serve as control factors. We employ an index of financial development which is constructed using the principal component analysis (PCA). The financial development index is based on two key dimensions of financial development—accessibility and depth of the financial sector. Similarly, in measuring institutional quality, an index of institutional quality is used. The index is based on different sub-institutional quality indicators which include voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption. For the control factors, bank stability is measured using bank z-score. We use the KAOPEN index by Chinn and Ito to measure financial openness. Competition is gauged by the Boone indicator. The data for the study are gleaned from the World Development Indicators, Worldwide Governance Indicators, and Global Financial Development Database.

3.2. Model and Estimation Technique

Given that the present study takes a panel approach, the basic model can be generally specified as:

$$Y_{it} = \alpha + \beta' X_{it} + \varepsilon_{it} \tag{1}$$

where the subscript i is the cross-sectional dimension and t represents the time period. The coefficients of the explanatory factors are signified by β and ε is the error term. The letter Y represents bank profitability (dependent variables) and X denotes the independent variables.

We introduce the lag of the dependent variable to consider the time persistence of bank profitability. In this case, it is assumed that the current profitability level of banks may be influenced by the previous value. Hence, Equation (1) can be modified as:

$$Y_{it} = \alpha + Y_{it-1} + \beta' X_{it} + \varepsilon_{it} \quad (2)$$

We employ the Generalized Method of Moments (GMM) technique by Arellano & Bond (1991) to resolve the issue of bias in the model estimations following the introduction of the lag term of profitability. The problem of endogeneity is also addressed by this technique (Al-Faryan, 2021).

4. Empirical Results

4.1. Descriptive Statistics

In Table 1, the summary statistics of the variables are presented. Bank profitability when measured by ROA has an average value of 2.154% with minimum and maximum values of −14.301% and 9.908% respectively. In terms of ROE and NIM, the average bank profitability is 21.581% and 7.112% respectively. The standard deviation values for our profitability measures (ROA, ROE, and NIM) are 1.884%, 16.878%, and 3.172 respectively. Financial development index (FDEV) has a mean value of −5.22E−18 with a standard deviation of 1.256. The average value of the institutional quality index (INSQ) is 0.167 and ranges from −4.046 to 5.478. Banks' z-score which measures stability (STAB) has an average value of 11.452 with a maximum value of 42.899 and a standard deviation of 6.007. Financial openness (FOP) and bank competition (COMP) have mean values of −0.604 and −0.096 respectively. In addition, our variables are positively skewed except for bank return on assets and bank competition. In terms of kurtosis, the variables have leptokurtic-shaped distributions. The Jarque-Bera test further indicates that the variables are not distributed normally at 5% significance level.

Table 1. Descriptive statistics.

	ROA	ROE	NIM	FDEV	INSQ	STAB	FOP	COMP
Mean	2.154	21.581	7.112	−5.22E−18	0.167	11.452	−0.604	−0.096
Median	2.014	18.539	6.649	−0.398	0.145	10.301	−1.210	−0.070
Maximum	9.908	160.344	18.634	4.950	5.478	42.899	2.347	0.321
Minimum	−14.301	−24.831	0.572	−1.199	−4.046	2.616	−1.917	−2.541
Std. Dev.	1.884	16.878	3.172	1.256	2.126	6.007	1.273	0.202
Skewness	−1.740	2.673	0.726	2.510	0.292	1.493	1.508	−6.207
Kurtosis	25.328	18.109	3.254	8.817	2.887	6.859	3.772	60.857
Jarque-Bera	9510.987	4784.192	40.461	1461.363	6.575	443.493	180.565	65216.470
Probability	0.000	0.000	0.000	0.000	0.037	0.000	0.000	0.000

4.2. Correlation Analysis

Table 2 shows the correlation analysis results, which demonstrate how the independent variables are interrelated. The results show that the correlation coefficients between the variables are generally low, with the highest correlation coefficient of 0.5541 (between institutional quality and financial development). With the variance inflation factor (VIF) analysis, the highest VIF value reported is 1.5711, with a tolerance value of 0.6365. In all cases, there is evidence that our study does not have multicollinearity problems, as VIFs greater than 10 indicate a high correlation (multicollinearity) and should be of concern (Al-Faryan & Alokla, 2023).

4.3. Regression Results

The results of the regression analysis based on the GMM estimator are presented in Table 3. From the model diagnostics, the Wald test estimates indicate that the explanatory variables are jointly significant. Also, the Sargan tests suggest that the null hypothesis, which specifies that the over-identification restrictions are valid, cannot be rejected in all cases, suggesting the appropriateness of the instruments in the study. We further note that at 5% significance level, there is no second-order autocorrelation as depicted by the AR(2) test, except in the model where ROA is used as the dependent variable.

From the results, we can infer that profitability has a positive self-reinforcing effect. This implies that the prior profit level has a significant positive impact on the current profit level, which supports Hypothesis 1. The findings show that financial development exerts a significant negative effect on banking sector profitability. Thus, Hypothesis 2 is not supported. This result holds regardless of the indicator of profitability. This signifies that an increase in the depth, accessibility, and efficiency of the banking industry does not necessarily translate into increased profitability. This finding can be attributed to the underdeveloped state

Table 2. Correlation analysis.

	FDEV	INSQ	STAB	FOP	COMP
FDEV	1.0000				
INSQ	0.5541	1.0000			
STAB	0.1975	0.0090	1.0000		
FOP	0.3420	0.3857	0.00764	1.0000	
COMP	0.0006	0.0578	−0.0585	−0.0004	1.0000
VIF	1.5711	1.5657	1.0608	1.2105	1.0079
Tolerance (1/VIF)	0.6365	0.6387	0.9427	0.8261	0.9922

FDEV is financial development, INSQ is institutional quality, STAB is bank stability, FOP is financial openness, and COMP is bank competition.

Table 3. GMM regression results.

Variables	ROA	ROE	NIM
Lag_{t-1}	0.00404	0.0953***	0.177***
	(0.0107)	(0.0193)	(0.0186)
FDEV	−1.502***	−11.26***	−1.492***
	(0.0854)	(1.956)	(0.272)
INSQ	0.143***	1.311***	0.172***
	(0.0436)	(0.469)	(0.0414)
STAB	0.235***	1.643***	0.113***
	(0.0479)	(0.203)	(0.0265)
FOP	0.104	−5.988**	1.043***
	(0.208)	(2.392)	(0.237)
COMP	4.701***	−0.614	−1.299***
	(0.231)	(3.107)	(0.238)
Constant	−0.0564	−6.324	4.679***
	(0.498)	(4.097)	(0.284)
Diagnostics			
Wald χ^2	1109.190	1529.920	757.050
Pro. (Wald χ^2)	0.000	0.000	0.000
Sargan test	28.950	26.713	26.587
Prob. Sargan test	1.000	1.000	1.000
AR(2)	−2.049	−1.388	0.081
Prob. AR(2)	0.041	0.165	0.935
Observations	381	381	381
Number of Countries	33	33	33

***p < 0.01, **p < 0.05, Standard errors in parentheses. GMM (dynamic generalized method of moments), the Sargan test is conducted using one-step homoscedastic estimation/error. ROA, ROE, and NIM are measures of profitability. Lag_{t-1} is the first lag of the dependent profitability measure. FDEV is financial development, INSQ is institutional quality, STAB is bank stability, FOP is financial openness, and COMP is bank competition.

of the African banking sector. The depth and accessibility of the financial systems in Africa are at a lower stage of development (Mutarindwa et al., 2021). As a result, the sector may be unable to achieve the appropriate degree of profitability. Our finding is similar to that of Ozili & Ndah (2021).

The results show that institutional quality positively and significantly influences bank profitability, which supports Hypothesis 3. This suggests that an increase in institutional effectiveness boosts bank profit growth. Institutional mechanisms such as regulatory quality may strengthen bank operations and reduce

bank risk, thereby increasing profitability. Also, strong institutions minimize banks' operational costs in an exclusively compliant way (Muriu, 2011).

We find that bank stability has a positive and significant effect on profitability, thus supporting Hypothesis 3. The implication is that bank stability boosts confidence in the entire financial system. As a result, banks can improve their operational efficiency by mobilizing more deposits and advancing more loans at competitive rates, thus enhancing their profitability. Financial openness has a negative significant effect on profitability (measured by ROE), thus rejecting Hypothesis 3, while being positive when bank profitability is measured by NIM, thus supporting Hypothesis 3. Similarly, the impact of bank competition on profitability varies depending on the metric used to measure profitability. Hypothesis 3 is supported by the fact that competition makes banks more profitable in terms of ROA, but the effect on NIM is negative and significant, which means that Hypothesis 3 is rejected.

5. Conclusions, Implications and Directions for Further Research

Banks play a vital role in the economic growth of a country. A sound financial system is required for efficient financial mediation, which leads to long-term investments and growth in entrepreneurial activities. To withstand macroeconomic turmoil and ensure the stability of the financial system, it is critical to unearth the key factors affecting the profitability of the banking sector. Hence, the purpose of this research is to critically examine how financial development influences the profitability of banks in Sub-Saharan Africa. This study uses data from 33 countries from 2000 to 2017. In addition, the study assesses the effect of institutional quality, bank stability, financial openness, and competition on profitability. Using the generalized method of moments (GMM) technique, the results show that financial development has a significant negative impact on bank profitability. We observe that institutional quality positively and significantly drives profitability. Bank stability and profitability are positively and significantly related. The findings further indicate that financial openness negatively affects profitability (measured by ROE) and that the impact on NIM is positive. Bank competition influences ROA positively, whereas a negative effect is documented for NIM as an indicator of profitability.

The findings have significant implications. For instance, financial sector regulators need to devise measures to enhance the various components of financial development. Specifically, efforts toward enhancing deposit mobilization, credit advancement, and avenues for financial services access are imperative. To create a favorable climate for banks to function well, institutional structures should be strengthened. For banks, regulatory quality is essential for the solidity of the sector. Given the positive and significant effect of bank stability on profit growth, stringent measures, including capital requirements and default preventive measures, need to be put in place to ensure further stability of the sector in an

attempt to enhance banks' profit growth. The study only looks at the direct effect of financial development on profitability; it makes no attempt to account for how other variables could moderate this linkage. Therefore, mediating variables should be included in future research to examine how they interact with financial development to drive profitability. In addition to the GMM approach employed in this study, future studies may use other econometric techniques to determine the robustness of the findings.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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