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Examining the impact of income diversification on bank performance: Are foreign banks heterogeneous?

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ABSTRACT

This study examines the heterogeneity of foreign banks in the income diversification and performance nexus. We utilize annual bank data across 46 countries in Sub-Saharan Africa over the period 2011–2018 and find that increased income diversification improves banks performance, and the Global and Emerging banks perform better than the regional African and domestic banks. Regarding how different foreign banks benefit from income diversification, we find that Global banks benefit from diversification more than their counterparts operating in the region. The Emerging country banks outperform the African and domestic banks, while the local banks in the region benefit from income diversification more than the regional African banks. The results of this study suggest that the emerging banks and the regional African banks do not always exhibit similar features like the Global banks. The observations in this study make significant contribution to the literature by providing new insight into the non-homogeneity of foreign banks in the income diversification pendulum.

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International banking; Income Diversification: Bank performance; Non-interest income: Foreign ownership: Generalized Method of Moment (GMM)

1. Introduction

The income structure of banks has significantly changed from interest income sources to include non-traditional income activities within the past few decades. In response, a pool of studies has emerged examining why banks have diversified their income sources (e.g., Hamdi, Hakimi, & Zaghdoudi, 2017; Meng, Cavoli, & Deng, 2018) and the impact of the diversification on bank performance (e.g., Ahamed, 2017; Baele, De Jonghe, & Vander Vennet, 2007; Chiorazzo, Milani, & Salvini, 2008; Kim & Kim, 2020; Meslier, Tacneng, & Tarazi, 2014; Nisar, Peng, Wang, & Ashraf, 2018). Although the impact of income diversification on banks' performance is well addressed in the literature, there is no consensus; some evidence (e.g., Ahamed, 2017; Meslier et al., 2014; Nisar et al., 2018) show the presence of economies while others (e.g., Francis, Hasan, Küllüc, & Zhou, 2018; Kim & Kim, 2020; Stiroh & Rumble, 2006) portray diseconomies of income diversification. The proponents of income diversification benefits claim that by exploiting managerial skills and economies of scopes, banks can benefit from income diversification while

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the opponents contend that diversification may dilute the comparative advantage of management and increase the volatility of profits. The contrasting findings on the income diversification and bank performance nexus may be attributed to the lack of attention to crucial factors that may directly affect that relationship.

When banks move towards non-interest income sources from interest-based lending activities, they need to have the capacity, resources, skills, and a sophisticated technological scale (Hamdi et al., 2017; Meslier et al., 2014; Pennathur, Subrahmanyam, & Vishwasrao, 2012). Therefore, the effect of diversification towards non-interest income on the performance of banks may vary across different categories of banks such as foreign versus local, private versus public, and big versus small banks. In this regard, few studies have considered the effect of income diversification across different bank ownership categories by detaching domestic banks owned by local governments from the private ones but collectively defining all banks with ultimate ownership outside the host country as foreign banks without any recourse to the possible heterogeneity across foreign banks (e.g., Ahamed, 2017; Alouanea, Kahloula, & Grirab, 2021). A recent strand of studies highlights the growing heterogeneity of foreign banks relating to their countries of origin (e.g., Pelletier, 2018; Yildirim, Kasman, & Hamid, 2021). Foreign banks may not be homogenous concerning their business models, internationalization strategies, and home markets; so, they may exhibit different performances in non-traditional banking business. However, there is yet to be a study that specifically examines the impact of income diversification on the performance of different foreign banks. Thus, this study fills a lacuna in the literature by examining the heterogeneity of foreign bank ownership in the income diversification pendulum.

It is a significant development that while international non-African banks remain key players within the African landscape, the rise of regional African banks who operate with a pro-African orientation and aspirations has greatly changed the dynamics of the African banking landscape. Certain regional African banks have spread their operations and presence to several countries. These pan-African banks include Ecobank Transnational (from Togo), which has its presence in 30 countries spanning East Africa, West Africa, and Central Africa. Other notable African banks, such as the Standard Bank of South Africa, have also advanced efforts to invest outside Africa, establishing a branch and subsidiary presence in the developed world and other emerging countries. This development has led to several collaborations between local and foreign banks in the African financial services industries. These foreign entities include foreign subsidiaries of multinational banks from notable developed economies such as the UK and France, foreign subsidiaries of banks from emerging countries in the Middle East, Asia, and foreign affiliates of African banks.

As the presence of regional African banks and banks from other continents has increased sharply in Africa over the last two decades, the question of the effect of income diversification on these banks' performance and financial strength has become particularly relevant, especially in Africa where capital markets are mostly under-developed. This question is relevant to investors, bank managers, and other stakeholders who may be anxious about the performance and stability of their banks for the reason being that if business or environmental factors play an imperative role in how banks benefit from income diversification, then one can speculate that banks from countries with different income levels or those with several core businesses should be affected in a different way by non-interest-based activities. This problem is examined by comparing the diversification benefits of three different categories of foreign banks to the group of local banks in sub-Saharan Africa: regional African banks, global banks from developed countries, and emerging banks from non-African emerging economies. Regional African banks are banks that originate from Africa. Global banks are banks originating from developed countries while emerging banks consist of banks founded in emerging or developing countries outside Africa.¹

We compare the diversification benefits of three different categories of foreign banks to the group of local banks in sub-Saharan Africa: regional African banks, global banks from developed countries, and banks from non-African emerging economies. We use the two-step System Generalized Method of Moment approach to model annual bank data across 46 countries in Sub-Saharan Africa over the period 2011-2018. Our sample contains 193 local banks, 181 regional African banks, 69 Global banks, and 24 banks from emerging countries. The results of the study show that a shift from interest-vielding income to non-interest income activities results in bank gains regarding profits and riskadjusted profits of banks in Sub-Saharan Africa. The results also show that there exist significant differences across the foreign bank ownership groups. The results indicate that the Global banks tend to outperform the Regional African banks, the Emerging country banks, and the domestic reference banks. The Emerging banks also outperform the Regional African banks while the domestic banks perform better than the African banks. Regarding how different foreign banks benefit from income diversification, we find that Global banks benefit from diversification more than their counterparts operating in the region. The Emerging country banks also outperform the African and domestic banks when they diversify their income sources. Our results also reveal that local banks in the region benefit from income diversification more than the regional African banks. The results of this study suggest that the emerging banks and the regional African banks do not always exhibit similar features like the Global banks, so it may be misleading to consider the homogenous impact of all foreign banks.

The observations in this study make the following contributions to the literature. First, this study provides new insight into the heterogeneous impacts of foreign bank ownership in the income diversification pendulum. Although the existing studies (e.g., Ahamed, 2017; Alouanea et al., 2021) have acknowledged the impact of bank ownership in the diversification–performance nexus, this is the first study that specifically examines the heterogeneity of foreign banks in income diversification gains. Recent studies high-light the growing heterogeneity of foreign banks relating to their countries of origin (Pelletier, 2018; Yildirim et al., 2021), but evidence on how income diversification affects different categories of foreign banks in non-existing. This study provides evidence on the heterogeneity of foreign banks in recouping income diversification benefits. Second, this study adds to the ongoing debate on the impact of income diversification on bank performance by employing unexploited and current data from banks across Sub-Saharan Africa. The extant studies on the bank income diversification and performance nexus have focused on developed countries (e.g., Baele et al., 2007; Chiorazzo et al., 2008;

¹Developed countries refer to countries classified by the World Bank as "high income", defined as countries with a GNI/ capita above \$12,535 (July 2020). Emerging countries include both "upper middle" and "lower middle-income" countries, with a GNI/capita between \$1,036 and \$12,535.

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DeYoung & Rice, 2004; Hsieh, Chen, Lee, & Yang, 2013; Stiroh, 2004) and a few on emerging countries (Ahamed, 2017; Brahmana, Kontesa, & Gilbert, 2018; Meslier et al., 2014) while such studies on banks in Sub-Saharan Africa, is very scarce. Finally, the study contributes to the growing literature on the performance of different foreign banks in developing countries. The remaining parts of the study are organized as follows: Section 2 presents the review of relevant literature, Section 3 details the research methodology and data description, Section 4 contains the empirical analysis while Section 5 concludes the study.

2. Literature review and research hypotheses

2.1. The effect of income diversification on bank performance

The existing studies on the impact of income diversification on bank performance provide mixed results. While some studies report that banks benefit from income diversification (e.g., Ahamed, 2017; Brahmana et al., 2018; Gurbuz, Yanik, & Ayturk, 2013), others lament that income diversification ruins bank performance (e.g., Francis et al., 2018; Kim & Kim, 2020; Stiroh & Rumble, 2006).

Chiorazzo et al. (2008) used annual financial data of banks to examine how diversification affects the performance of Italian banks. They study found a that non-interest income significantly improves risk adjusted returns. Their results also shown that the association between risk-adjusted profit and bank size is an inverted U-shape. Beyond its optimal size, an increase in bank size only led to a fall in risk-adjusted profit. For larger banks, the direct relation between risk-adjusted returns and non-interest income activities was observed to be stronger. This afforded bigger banks stability in income. Improvements in performance were also found with increase in non-interest income activities generally. Similarly, Brahmana et al. (2018) recently employed data on banks in a panel fixed effect model and found that diversification improves the performance of banks in Malaysia. They argue that since the Malaysian financial system is not endowed with intense integration, this reduced integration becomes the very strength that aids banks in Malaysia to realize great gains from diversification. The study additionally speculated that the rise of Islamic banking may contribute immensely to the gains from income diversification. The other evidence on emerging markets also reveal that income diversification improves banks performance (e.g., Chi, 2006; Deng & Li, 2006; Meslier et al., 2014; Nguyen, Vo, & Nguyen, 2015; Sanya & Wolfe, 2011).

Conversely, some studies from developed regions have shown that income diversification worsens the performance of financial institutions. Stiroh (2004) asserts that an increase in revenue from fees leads to a deteriorating trade-off between risk and return results. Moreover, DeYoung and Roland (2001) provide empirical proof, which shows that banks witness a drop in performance in instances where they have diversified their income streams into non-traditional activities as opposed to the usual banking operations. Drawing on their study of banks in Italy, Acharya, Hasan, and Saunders (2006) conclude that superior performance and risk reduction cannot be achieved by banks simply through the means of asset diversification. Esho, Kofman, and Sharpe (2005) undertook an assessment of credit unions in Australia and endorsed the prevailing evidence that increases in revenue which stems from transaction fees tends to increase risk and shrink returns, while activities that lead to a rise in revenue from residential lending reduce both risk and returns. A recent study by Francis et al. (2018) on the impact of diversification on bank performance revealed that diversification (focus) at the asset, industry and borrower levels decreases returns. However, once banks' screening and monitoring abilities are controlled for, the effect of diversification/focus either gets weaker or disappears. Other inquiries such as Stiroh and Rumble (2006) have strengthened the case that financial performance is made worse by activities of diversification. The contrasting findings lead us to formulate the following hypotheses:

H1a: Income diversification will enhance bank performance

H1b: Income diversification will ruin bank performance

2.2. Income diversification, foreign ownership, and bank performance

The uniqueness of bank characteristics, institutional objectives, and the origins of banks may impact the performance of banks across different groups. The literature that examines the performance of banks across different ownership groups is inconclusive and divergent. Some empirical evidence advocate that foreign banks are more profitable (e.g., Berger, Hasan, & Zhou, 2009; Sahoo & Tone, 2009), while others reveal that local banks perform better (Das & Ghosh, 2006; Tabak & Tecles, 2010). The study by Micco, Panizza, and Yanez (2007) on industrialized countries does not provide any evidence to support the assertion that foreign banks perform better than local banks but they do find support for the developing economies. Dietrich and Wanzenried (2011) also find that Swiss local state-owned banks perform better than foreign private banks throughout the financial crisis period.

The empirical evidence on bank performance in developing economies on average favors foreign banks than their local counterparts. Evidence from Eastern European transition economies foreign banks are more profitable than local banks (Bonin, Hasan, & Wachtel, 2005). On the contrary, another research on transition economies documents mixed outcomes that foreign banks are less profitable but more cost sufficient than local banks (Yildirim & Philippatos, 2007). A study that employed data from 28 developing economies across different regions reveals that foreign banks dominate in terms of profit while private local banks and state-owned banks follow in order (Berger, DeYoung, Genay, & Udell, 2001). A study that utilized data from Pakistan that local private banks and state-owned banks are less profitable than foreign banks; nonetheless, the average cost efficiency is not significantly different across the three groups (Bonaccorsi Di Patti & Hardy, 2005). Again, Howcroft and Ataullah (2006) used a sample of Indian and Pakistani banks over 7 years (1992-1998) and established foreign banks experienced the greatest improvement in total factor productivity because of their technological efficiency and innovation while local banks experienced very little improvement in total factor productivity because of high delinquent loans and their inability to acclimatize to new technologies.

Some recent studies have accentuated the increasing heterogeneity of foreign banks based on their countries of origin (e.g., Pelletier, 2018; Yildirim et al., 2021). Foreign banks may not be homogenous concerning their business models, internationalization strategies, and home markets; so, they may exhibit different performances.

Considering the uniqueness of the banking groups in this study and the study setting, four different factors espoused in literature may impact performance across baking groups as they diversify: home country factor, host country factors, bank-level factors and distance factors (see Claessens & Van Horen, 2012).

The distance between a bank's home country and the host country is crucial, particularly in a relationship-based activity that requires knowledge beyond banking business and the local business environment (Berger et al., 2001). In the case of Africa, knowledge of the local environment is very critical because of the low transparency in many economies in the region with a larger informal sector and non-existent or limited formal documentation (Beck, Maimbo, Faye, & Triki, 2011). Both empirical (e.g., Mian, 2006; Berger and DeYoung, 2001; Claessens & Van Horen, 2014) and theoretical studies (e.g., Hauswald & Marquez, 2006) posit that foreign banks that originate from countries closer to the host country (regional African banks) are better able to obtain and use soft information than foreign banks from countries far away from the host country (outside banks). For example, Stein (2002) theoretically indicates that longer distance reduces bank managers' incentives to obtain "soft" information on projects because it cannot be reliably transmitted. This implies that local banks would perform better than their foreign counterparts, especially when they diversify into businesses that require knowledge of the local environment. The regional African banks may also have an "institutional void" advantage in their home continent over the banks from other continents, which may find it difficult to access opaque businesses in Africa (Khanna & Palepu, 2010). These institutional voids encapsulate the absence of regulatory systems, specialized intermediaries, and contract-enforcing mechanisms and the difficulties in dealing with them (Khanna & Palepu, 2006). In addition, the African banks may also profit from an advantage related to the similarity of the demand between their country of origin and host countries. The similarities among the countries in the region would place the African banks in a better position to offer non-traditional banking products that are wellaligned to the demands in their host countries. By singling out the distance factor, the closeness of the foreign affiliates of African banks to their host countries would give them an advantage similar to that of the local banks.

The home country factors support the notion that foreign banks operating in developing economies do perform better than local and regional banks. The home country factor is also engrossed in the resource-based view on bank income diversification. In developed and emerging economies with better and educated labor force and regulatory systems, banks will be a better position to develop and adopt new technologies and financial instruments and diversify their income sources to boost performance (Berger et al., 2001). This will enable them to venture into high-earning non-traditional banking businesses. Banks that originate from countries with competitive banking markets are likely to be more innovative and profit efficient (Aghion & Howitt, 1998). Given that most of the banks from other continents come from countries that are developed than the economies in Africa, these Global and Emerging banks would have technology and innovation advantage over the domestic and the regional African banks when banks in the region move towards non-interest income activities.

The bank-level factor is important when explaining how banks benefit from income diversification. Banks affiliated to large banks can benefit from economies of scale when operating in different market segments than banks affiliated to smaller banks (Yildirim et al., 2021). The Global banks, in particular with most banks from the USA, UK and France could benefit from economies of scale in operating costs by affiliation to a large banking group. In non-traditional banking business, the Global and Emerging banks may benefit from scale economies through sharing of technology, managerial expertise, and innovation. Also, the well-established outside banks may have funding advantage over the local and regional African banks that belong to smaller banking group by way of financial support from the parent bank group through internal capital markets (Cetorelli & Goldberg, 2012). Lastly, the brand name of the Global and Emerging banks in Africa could give them advantage when they diversify into non-traditional banking activities knowing well that these banks have exploited non-banking activities in regions where banks have almost fully diversified their income sources. Thus, the connections among income diversification, bank foreign ownership and performance are hypothesized as follows:

H2: Bank performance will differ significantly across foreign ownership groups

H3: Diversification towards non-interest income will affect the performance of banks differently across foreign ownership groups.

3. Research Method and Data

This section presents the measurement of the study variables, data and the empirical strategy used in this study.

3.1. Measurement of study variables

3.1.1. Bank performance measures

In line with the relevant literature (e.g, Ahamed, 2017; Chiorazzo et al., 2008), this study employs four accounting ratios as measures of bank performance: return-on-assets (ROA), estimated as the ratio of profit before tax to total assets; return-on-equity (ROE), measured as the ratio of profit before tax to equity; risk-adjusted return-onassets (RAROA), which is estimated as ROA scaled by the standard deviation of ROA; risk-adjusted return-on-equity (RAROE) defined as ROE divided by the standard deviation of ROE. The study uses four measures of performance to ensure robustness of the estimates. We use the profit before tax instead of the net income to calculate the ROA and ROE to avoid accounting differences driven by deferring tax regulations across the countries in our sample. As suggested by Kohler (2014), we compute the standard deviations of ROA and ROE using a three-year rolling window.

3.1.2. Diversification measures

Following Meslier et al. (2014) and Chiorazzo et al. (2008), we estimate a Herfindahl-Hirschman-index (HHI) income diversification measure (Div) as follows:

$$Div_{it} = 1 - FOCUS_{it} \tag{1}$$

where a lower value of Div_{it} indicates less diversified banks (more focused) while a higher value indicates more diversified (less focused) banks. The indicator (FOCUS) is calculated as follows:

$$FOCUS_{it} = \left(\frac{NIN}{NTOP}\right)^2 + \left(\frac{INT}{NTOP}\right)^2$$
(2)

where net operating income (NTOP) is composed of non-interest income (NIN) and interest income (INT). FOCUS measures the degree of specialization in NTOP by banks; Non-interest income, NIN is also made up of three main components: trading, fee-based, and other non-interest income. The consitutents of non-interest income can be substituted into equation (4) to estimate (FOCUS-FTO) as expressed below.

$$FOCUS - FTO_{it} = \left(\frac{Fee}{NTOP}\right)^2 + \left(\frac{Trade}{NTOP}\right)^2 + \left(\frac{Others}{NTOP}\right)^2 + \left(\frac{INT}{NTOP}\right)^2$$
(3)

where Fee + Trade + Others = NIN and they represent fee-based income, trading income, other non-interest income and non-interest income, respectively. Fee based income denotes income from brokerage, commission, and exchange. Trading income includes net profit or loss on the sale of investments, the net profit or loss on revaluation of investments, and the net profit or loss on the sale of assets (including land) The other non-interest income includes all other non-interest income that cannot be categorized as fee and trading income. Additionally, we calculate the share of non-interest income as the ratio of non-interest income to operating income (NON), and we use this as an alternate measure of diversification for robustness checks.

3.1.3. Foreign ownership dummies

One variable of interest in the study is the classification of different foreign banks in Sub-Saharan Africa based on the home countries of these banks. For this study, we classify the sampled commercial banks operating in Africa into four ownership groups (Local banks, Global banks, Emerging banks, and Regional African banks). Regional African banks are banks that originate from Africa. Global banks are banks originating from developed countries while the emerging banks consists of banks founded in emerging or developing countries outside Africa.

We include the dummies for the three foreign banks: African banks, Emerging banks and Global banks and we exclude the dummy local banks; thus, the interpretation of the regression results for the three foreign ownership categories is relative to local banks, the benchmark. The bank ownership was determined by using the global ultimate owner indicator from the Bureau van Dijk BankFocus database. An entity is a global ultimate owner of a bank if the entity controls at least 50.01% of the bank. Mergers and acquisitions of banks that took place through the study period were also considered by tracking the Bureau van Dijk ID number (BvD ID) of each bank in the Zephyr and Osiris databases of Bureau van Dijk, which contains the details of all M&As. The mergers and acquisitions (M&As) in the study period were checked to make sure that only the acquiring bank or merged bank remained in the sample after such an event.

3.1.4. Control variables

We employ a number of bank-level and country-level controls found in the relevant literature (e.g., Baele et al., 2007; Chiorazzo et al., 2008; Sanya & Wolfe, 2011; Stiroh & Rumble, 2006). For bank-level controls, we use bank size (SIZE), the natural logarithm of total assets to control for size-induced bank differences; larger banks may have better opportunities in income diversification business than smaller ones and larger banks may also suffer from diseconomies of scale. We also include capital ratio (CAR) and operating cost (OPC) to control for differences in bank capital and overhead expenses, respectively. CAR is measured as the ratio of capital finds to total assets while OPC is defined as the ratio of operating expenses to total assets. For macro-level controls, we use GDP growth (GDPG) proxied by the annual GDP growth rates, inflation rates (INF), and the business environment measured using the doing business index (DBI).

3.2. Data

We employ a homogenous sample that focuses only on commercial banks in 46 sub-Saharan African countries (all countries in Africa excluding Algeria, Morocco, Libya, Tunisia, Egypt, Libya, Djibouti, Comoros, and Eritrea). Our sample contains annual data of 467 commercial banks for the period of eight years (2011–2018). The sample is made up of 193 local banks, 181 African regional banks, 69 Global banks, and 24 banks from emerging countries. The bank-level data were obtained from the Moody's Analytics Bureau van Dijk BankFocus database while the macro-economic data used in this study were sourced from the World Bank country indicators database.

3.3. The main empirical strategy

This study examines the impact of bank income diversification on different groups of foreign banks operating in Sub-Saharan Africa. First, we examine the impacts of income diversification and foreign ownership on bank performance, and ultimately, we analyse how bank foreign ownership affects the relationship between income diversification and performance.

We examine the impacts of diversification and bank ownership on performance by adopting empirical models used in similar studies (e.g., Ahamed, 2017; Chiorazzo et al., 2008; Pelletier, 2018). The baseline model for the impacts of diversification and foreign ownership on performance is expressed as follows:

$$\begin{aligned} Performance_{it} &= \beta_0 + \beta_1 Div_{it} + \beta_2 \text{Global}_{it} + \beta_3 \text{Emerging}_{it} + \beta_4 \text{African}_{it} + \beta_{\Phi} X_{it} \\ &+ \beta_{\nu} Z_{jt} + V_{ijt} \end{aligned} \tag{4}$$

Where *i* denotes bank *i* in country *j* in year *t*; *Performance* indicates bank performance measured by ROA, ROE, RAROA, and RAROE; Div is the HHI measure of income diversification, Global is a dummy variable that equals one if the bank originates from

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developed countries; Emerging is a dummy variable that equals one if the bank is founded in emerging or developing countries outside Africa while African denotes dummy variable that equals one for Regional African banks (banks originating from Africa); X is a vector of bank-level controls and Z is a vector of country controls. $V_{ijt} = \lambda_t + \mu_{j+} \epsilon_{ijt}$ where λ_t, μ_j , and ϵ_{ijt} are the year effect, country effect, and the stochastic error term, respectively.

The past performance of banks may determine present performance and the explanatory variables in Eq. (4) may not be strictly exogenous. Thus, we employ a dynamic model, the System Generalized Method of Moment (SYS-GMM) estimator proposed by Arellano and Bover (1995) and Blundell and Bond (1998). By employing the SYS-GMM estimation method, we are able to overcome two critical econometric issues: (i) since the prior values of performance can determine the present values, the SYS-GMM afford us the opportunity to use the lagged values of the dependent variables to exploit the dynamic nature of the data. (ii) the explanatory variables may not be strictly exogenous, and the use of SYS-GMM can eliminate endogeneity issue while using lagged levels and lagged differences of the regressors as instruments. The dynamic form of the basic model is specified as follows:

$$Performance_{it} = \beta_0 + \beta_1 Performance_{it-1} + \beta_2 Div_{it} + \beta_3 Global_{it} + \beta_4 Emerging_{it} + \beta_5 African_{it} + \beta X_{it} + \beta_y Z_{jt} + V_{ijt}$$
(5)

The uniqueness of the origins and ownership of banks may improve or undermine the performance impact of income diversification on banks operating in Sub-Saharan Africa. Based on the main implications of income diversification and bank ownership and allowing for other factors to influence a bank's overall performance, we examine the role of foreign banks ownership in the performance and diversification relationship using the following model:

$$Performance_{it} = \beta_0 + \beta_1 Performance_{it-1} + \beta_2 Div_{it} + \beta_3 Global_{it} + \beta_4 Emerging_{it} + \beta_5 African_{it} + \beta_6 Div_{it} \times Global_{it} + \beta_7 Div_{it} \times Emerging_{it} + \beta_8 Div_{it} \times African_{it} + \beta_{\phi} X_{it} + \beta_Y Z_{jt} + V_{ijt}$$
(6)

Where $Div_{it} \times Global_{it}$; $Div_{it} \times Emerging_{it}$; $Div_{it} \times African_{it}$ are the interaction terms specifically measuring the diversification impacts of Global, Emerging and regional African banks, respectively. With reference to the local banks, the coefficients of the interaction terms, β_6 , β_7 , and β_8 explain whether income diversification enhances or impedes the performance of Global, Emerging and African banks, respectively.

4. Results and discussion

4.1. Descriptive analysis

For this section, we present the descriptive analysis of the banks variables for all banks, local banks, regional African banks, Emerging country banks, and Global banks. We also highlight the means of the key variables with respect to the 46 countries where the banks in our sample operate.

Panel	Variable	DIV	CAR	OPC	SIZE	ROA	ROE	RAROA	RAROE
All Banks	Mean	0.503	0.153	0.058	13.009	0.015	0.146	2.651	2.737
	Std. Dev.	0.137	0.119	0.041	1.537	0.051	0.610	3.182	3.370
	Min	0.002	0.004	0.000	8.307	1.465	-18.444	-4.523	-7.825
	Max	0.791	1.000	0.899	18.563	0.272	18.045	24.181	19.758
African	Mean	0.517	0.139	0.061	12.693	0.012	0.129	2.289	2.441
Banks	Std. Dev.	0.125	0.096	0.033	1.167	0.037	0.384	2.855	3.297
	Min	0.002	0.007	0.003	9.129	0.409	-11.000	-4.523	-6.877
	Max	0.770	0.977	0.351	16.162	0.134	1.391	11.211	16.457
Global	Mean	0.533	0.278	0.048	13.339	0.026	0.203	2.824	2.966
Banks	Std. Dev.	0.125	0.072	0.023	1.204	0.030	0.183	2.369	2.597
	Min	0.016	0.038	0.001	9.822	0.214	-0.885	-3.046	-2.801
	Max	0.744	1.000	0.156	18.563	0.145	1.327	10.786	19.758
Emerging	Mean	0.481	0.161	0.050	12.087	0.016	0.130	2.588	2.613
Banks	Std. Dev.	0.162	0.244	0.048	1.395	0.051	0.193	3.282	3.660
	Min	0.050	0.075	0.006	8.790	0.210	-0.432	-3.003	-2.781
	Max	0.713	0.991	0.275	14.272	0.179	0.883	10.193	12.944
Local	Mean	0.367	0.137	0.059	13.183	0.014	0.144	2.948	2.939
Banks	Std. Dev.	0.139	0.126	0.050	1.841	0.065	0.859	3.650	3.618
	Min	0.004	0.004	0.000	8.307	1.465	-18.444	-3.723	-7.825
	Max	0.791	0.980	0.899	15.589	0.272	18.045	24.181	17.655

Table 1. Descriptive statistics.

Note: DIV = HHI measure of income diversification; CAR = Capital adequacy ratio; OPC = operating cost; SIZE = bank size; ROA = Returns on Assets; ROE = Return on equity; RAROA = Risk-adjusted return on assets; RAROE = Risk-adjusted return on equity.

The descriptive statistics for all banks, Local, African, Emerging and Global banks are presented in Table 1, while the means of the key variables by country and the number of commercial banks from each country are presented in Table A1 (see appendix).

Table 1 shows the descriptive statistics for the banking groups in our study. The descriptive statistics indicate that the extent of income diversification (Div) varies across the local, African, Emerging, and Global banks. Global banks have average Div of 0.533, that of the emerging banks is 0.481. The local and African banks have average Div values of 0.367 and 0.517, respectively. The average Div reveals that Global banks are more diversified than the emerging, local and African banks for our study period. The operating cost of the African banks (6.1%), emerging banks (5.0%) and local banks (5.9%) are higher than that of the Global banks (4.8%). The average size of the Global banks is 13.339, that of the emerging banks is 12.087, that of the local banks is 13.183 while the average size of African bank is 12.693. The descriptive statistics of our sample shows that Global banks have higher average capital adequacy ratios (CAR) of 27.8% than African banks (13.9%), emerging banks (16.1%) and local banks (13.7%). The table also indicates that the average ROA of the Global banks (2.6%) is higher than that of the Emerging banks (1.6%), African banks (1.2%) and local banks (1.4%). In a similar vein, the ROE of Global banks (20.3%) is higher than that of the local banks (14.4%), emerging banks (13.0%) and the African banks (12.9%). For RAROA and RAROE, the local banks have higher average of RAROE than the African, Emerging and Global banks while the Global banks have average RAROA higher than those of the other banking groups. The differing description across the banking groups insinuates that it may be illusive to put all banks together and examine the performance effect of income diversification. Hence, the need to disaggregate the banking groups for a detailed analysis of how income diversification affects the performance of the local, African and outside banks.

The means of the bank variables are presented in Table A1 (in the appendix). Table A1 show that banks in Guinea Bissau, Somalia, Niger, and Mali have the highest average Div of 68.2%, 65.6%, 63.4%, and 61.8%, respectively, while banks in Chad and Equatorial Guinea have the least average Div of 27.0% and 17.2% respectively. The average Div values imply that commercial banks in Guinea Bissau, Niger, Somalia, and Mali are more diversified. The table also indicates that Ethiopia, Madagascar, Malawi, Sudan, Swaziland, and Sierra Leone have higher ROA while Mauritania and Mozambique have the least. Gambia, Ethiopia and Madagascar have higher ROE while the least come from Mauritania. Equatorial Guinea, Namibia and Swaziland have higher RAROA while Zimbabwe has the least. The highest RAROE also come from Ethiopia while the least come from Benin.

4.2 Regression results

4.2.1 Bank income diversification, foreign ownership and performance

Table 2 reports the OLS and the Two-Step System GMM estimations based on the baseline specification and the dynamic models in Eq. (4) and Eq. (5), respectively. For the OLS and the GMM estimates, ROA, ROE, RAROA, and RAROE are used as the dependent variables for columns (1), (2), (3) and (4), respectively. The coefficients of the explanatory variables for the two estimation methods differ to some extent but the effects of the independent variables are fundamentally consistent with signs that are theoretically and economically reasonable. In terms of signs and significance, there is some robustness between the two estimation approaches; nevertheless, we limit the explanation of the results in Table 2 to the two-step system GMM results due to limited space.

Generally, the null hypothesis of the Arellano and Bond test for autocorrelation favors no autocorrelation and it is applied to the differenced residuals. The test for AR (2) is very vital since it detects the presence of serial autocorrelation in the model. The Sargan test of over-identifying restrictions is also very useful in validating the variables used as instruments in the model. The Sargan p-values reported in Table 2 shows that we cannot reject the joint hypothesis that the over-identifying restrictions are valid, thus, the internal instruments are valid. Also, the AR (2) values reported confirm that the models do not suffer from serial autocorrelation. The GMM results in Table 2 confirm the autoregressive properties of the performance indicators since the past values of all the four performance indicators significantly and positively impact their present values.

Table 2 indicates that the coefficients of the diversification measure, Div are positive and significant across all the four performance measures in columns (1) to (4), signifying that increased income diversification enhances banks performance. In general, the regression outcome reported in Table 2 shows that a shift from interestyielding income to non-interest income activities results in bank gains regarding profits and risk-adjusted profits, supporting Hypothesis 1a. The results obtained for the positive impact of income diversification on bank performance is similar to the results reported by Chiorazzo et al. (2008), studying Italian banks, Meslier et al. (2014), studying Philippines banks and Ahamed (2017) studying Indian banks. Nevertheless, the result in this study contrast the outcome of studies based on the Chinese banking

		0	LS		Two-step system GMM					
Variable	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)		
t-1	-	-	-	-	0.284***	0.370***	0.367***	0.425***		
	-	-	-	-	(0.059)	(0.052)	(0.047)	(0.044)		
Div	0.020**	0.056***	0.218	0.171	0.019***	0.028***	0.497**	0.137**		
	(0.002)	(0.012)	(0.132)	(0.119)	(0.005)	(0.012)	(0.167)	(0.058)		
Global	0.007**	0.036**	0.065	0.116	0.003***	0.007***	0.213**	0.153		
	(0.002)	(0.012)	(0.158)	(0.167)	(0.001)	(0.003)	(0.102)	(0.209)		
Emerging	0.003	0.030**	0.159*	0.294	0.001	0.010***	0.152	0.270**		
	(0.003)	(0.012)	(0.047)	(0.283)	(0.002)	(0.005)	(0.128)	(0.121)		
African	-0.004*	-0.012	-0.335**	0.151	-0.002***	-0.010	-0.231***	0.077		
	(0.001)	(0.004)	(0.125)	(0.133)	(0.001)	(0.006)	(0.113)	(0.190)		
CAR	0.043***	0.091**	0.130	0.649	0.072***	0.081**	2.417**	1.878*		
	(0.005)	(0.037)	(0.508)	(0.539)	(0.037)	(0.035)	(1.185)	(0.712)		
SIZE	0.004***	0.047***	0.939*	0.957**	0.004***	0.035**	0.661***	0.558***		
	(0.000)	(0.003)	(0.045)	(0.047)	(0.001)	(0.017)	(0.221)	(0.131)		
OPC	-0.489***	-0.727**	-3.238*	-2.149*	-0.033***	-0.240***	-1.767***	-2.434***		
	(0.019)	(0.132)	(1.185)	(0.894)	(0.007)	(0.117)	(0.860)	(1.141)		
GDP	0.003**	0.001	0.081***	0.058*	0.000*	0.000	0.026***	0.017		
	(0.001)	(0.002)	(0.024)	(0.025)	(0.000)	(0.002)	(0.014)	(0.015)		
INF	0.001***	0.006***	0.033**	0.038**	0.001***	0.003***	0.027***	0.023***		
	(0.000)	(0.001)	(0.014)	(0.015)	(0.000)	(0.001)	(0.008)	(0.008)		
DBI	0.000	0.002**	0.052*	0.034	0.000**	-0.002	0.024*	-0.011		
	(0.000)	(0.001)	(0.021)	(0.023)	(0.000)	(0.002)	(0.014)	(0.013)		
Constant	-0.023	-0.373***	-5.102***	-3.368***	-0.084	-0.162	0.000	-3.035***		
	(0.018)	(0.125)	(1.686)	(1.789)	(0.074)	(0.320)	(0.000)	(1.025)		
Time effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Counry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
effect										
AR (2)	-	-	-	-	0.231	0.141	0.195	0.468		
Sarg	-	-	-	-	0.421	0.161	0.328	0.236		
p-values										
Observations	2985	2912	2735	2642	2895	2837	2631	2544		

Table 2. Bank income diversification, foreign ownership, and performance diversification on.

Note: Standard errors in parentheses. *p < 0.1, **p < 0.05, ***p < 0.01.

industry, where over-diversification and under-diversification erodes bank gains from income diversification (e.g., Chi, 2006; Deng & Li, 2006). The evidence obtained in this study is also different from the results of many US banking studies (e.g., Stiroh, 2004; Stiroh & Rumble, 2006).

The regression results reported in Table 2 also reveal that there exist significant differences across the foreign bank ownership groups. For the foreign bank ownership, the reference group is the domestic banks. Columns (1) and (3) of the GMM results indicate that Regional African banks have significantly lower ROA and RAROA compared to the domestic reference banks. Also, columns (1) to (3) of the GMM results indicate that being a Global bank is associated with higher ROA, ROE and RAROA than that of the domestic banks. The table also shows that Emerging country banks have significantly higher ROE and RAROE (in columns 2 and 4) than that of the domestic banks. By comparing the coefficients of the foreign ownership dummies, the results imply that the Global banks tend to outperform the Regional African banks, the Emerging country banks and the domestic reference banks. The Emerging banks also outperform the Regional African banks while the domestic banks and the out-performance of the regional African banks, which

supports hypothesis 2. Our results are consistent with that of Claessens and Van Horen (2012), who revealed that geographical closeness does not improve performance in host developing countries. Similar to Claessens, Demirgüç-Kunt, and Huizinga (2001), we also found that foreign banks from developed countries outperformed domestic banks in developing countries, while foreign banks from developing countries performed worse than domestic banks.

Regarding the control variables, we note that equity capital and banks size are significantly and positively related to bank performance, while operating expense is significantly and negatively related to bank performance. Capital reflects the ability of banks to invest in non-traditional businesses and support unanticipated losses. Thus, the quality and strength of capital will affect the level of bank performance. The positive relationship between capital adequacy and the performance of banks is in line with the findings of Landi and Venturelli (2001). With regards to the positive impact of bank size on performance, the result is similar to that of existing studies that indicate bigger banks may have better opportunities to improve their performance (Baele et al., 2007; Sanya & Wolfe, 2011). For the country-level controls, we find that GDP and healthy business environment (proxied by the doing business index – DBI) have a significant positive impact on ROA and ROE of banks as indicated in columns (1) and (3) of Table 2. The results also indicate that inflation significantly and positively impacts all four indicators of bank performance (Columns 1 to 4).

4.2.2 The interactions of foreign ownership and bank income diversification

We now examine whether the influence of bank income diversification varies with different categories of foreign banks. Specifically, we analyze the role of foreign bank ownership in determining the gains from bank income diversification. Table 3 shows the regression estimates for how the interactions of diversification and foreign ownership affect bank performance based on Eq. (6). Columns (1), (2), (3), and (4) in Table 3 represent models with ROA, ROE, RAROA, and RAROE as dependent variables, respectively.

The coefficient of the interaction term $\text{Div} \times \text{Global}$ is significant and positive for the models in columns (1), (2) and (4), which means that income diversification significantly improves the ROA, ROE and RAROE of Global banks. The implication is that the gain from bank income diversification is significantly higher for Global banks than domestic banks. The coefficient of the interaction term $\text{Div} \times \text{Emerging}$ is also significant and positive for models (1) to (3), indicating that bank income diversification enhances the ROA, ROE and RAROA of emerging country banks than their domestic counterparts. The results also show that the interaction term $\text{Div} \times \text{African}$ is significant and negative for models (1) to (3) signifying that income diversification significantly impairs the performance of regional African banks as compared to their domestic counterparts. By way of comparison across the interaction terms, it could be observed that the gains from diversification is significantly higher for the Global banks than those of the two other foreign banks and the domestic banks. The benefit of income diversification is also higher for banks from emerging countries than those of African and domestic banks. Among the foreign bank categories, the regional African banks have the least gain from income

diversification and the gain is still lower than that of the domestic banks. The disparities in the gains from bank income diversification across different categories of foreign banks support hypothesis 3.

The observed higher-income diversification gains for the Global and Emerging country banks may be because those banks have more sophisticated technology and managerial skills than their regional African counterparts, which may not have the expertise required to be more competitive in non-traditional banking activities (Meslier et al., 2014; Sanya & Wolfe, 2011). Another possible explanation for the differing impact of diversification on performance across different foreign banking groups is that banks affiliated to relatively large banks can benefit from economies of scale when operating in different market segments than banks affiliated to smaller banks (Yildirim et al., 2021). The Global banks in particular, with most banks from the USA, UK and France could benefit from economies of scale in operating costs by affiliation to a large banking group. In non-traditional banking business, the Global banks may benefit from scale economies through sharing of technology, managerial expertise, and innovation. Also, the brand name of the Global and Emerging country banks in Africa could give them advantage when they diversify into non-traditional banking activities knowing well that these banks have exploited non-banking activities in regions where banks have almost

Variables	(1)	(2)	(3)	(4)
t-1	0.321***	0.324***	0.377***	0.425***
	(0.057)	(0.059)	(0.048)	(0.047)
Div	0.021***	0.037*	0.690***	0.277
	(0.006)	(0.014)	(0.236)	(0.273)
Div $ imes$ Global	0.015**	0.039***	0.675	0.788**
	(0.007)	(0.013)	(0.910)	(0.220)
Div \times Emerging	0.012**	0.019*	0.254**	0.462
5 5	(0.005)	(0.008)	(0.127)	(0.484)
Div \times African	-0.004***	-0.029**	-0.551*	0.319
	(0.001)	(0.006)	(0.246)	(0.163)
Global	0.007**	0.022***	0.340	0.227*
	(0.003)	(0.010)	(0.228)	(0.109)
Emerging	0.006*	0.011**	0.256**	0.087
5 5	(0.001)	(0.04)	(0.104)	(0.511)
African	-0.000***	-0.018**	-0.241*	-0.022
	(0.000)	(0.007)	(0.112)	(0.351)
CAR	0.104***	0.204*	2.628*	1.047
	(0.036)	(0.106)	(1.484)	(1.092)
SIZE	0.005*	0.053***	0.653***	0.578***
	(0.003)	(0.015)	(0.139)	(0.137)
OPC	-0.716***	-0.939***	-1.770***	-3.660***
	(0.107)	(0.310)	(0.605)	(1.372)
GDPG	0.000*	0.002	0.027**	0.020
	(0.000)	(0.002)	(0.014)	(0.015)
INF	0.001***	0.004***	0.026***	0.024***
	(0.000)	(0.002)	(0.008)	(0.009)
DBI	0.000	0.001	0.024*	-0.005
	(0.000)	(0.003)	(0.013)	(0.013)
Constant	0.000	-1.282*	0.000	0.000
	(0.000)	(0.759)	(0.000)	(0.000)
Time effect	Yes	Yes	Yes	Yes
Country effect	Yes	Yes	Yes	Yes
AR (2)	0.855	0.332	0.622	0.247
Sargan p-values	0.460	0.240	0.579	0.404
Observations	2895	2837	2631	2544

Table 3. The interactions of foreign ownership and income diversification.

Note: Standard errors in parentheses. * p < 0.1, ** p < 0.05, *** p < 0.01.

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fully diversified their income sources. The findings for the abysmal performance of the regional African banks in bank income diversification business resonates the results of Claessens and Van Horen (2012), who revealed that geographical closeness does not enhance performance in host developing countries. The disparities in income diversification gains across the banking groups is also in line with the study of Claessens and Van Horen (2012), who discovered that foreign banks from developing countries performed worse than local banks while foreign banks from developed countries outperformed domestic banks in developing countries.

4.2.3 Robustness checks

We check the robustness of our results for the interaction of income diversification and foreign bank ownership by applying an alternative measure of income diversification, the share of non-interest income in total assets (NON). We use the alternate measure of income diversification to analyze the interaction of the share of non-interest income and bank foreign ownership dummies and the impact of the performance indicators. The results for the interaction of the share of non-interest income and bank foreign

Table 4. Interactions of share of non-interest income and foreign ownership.

Variables	(1)	(2)	(3)	(4)
t-1	0.299***	0.299***	0.361***	0.429***
	(0.077)	(0.054)	(0.050)	(0.045)
NON	0.024***	0.018**	0.876**	0.461
	(0.013)	(0.008)	(0.407)	(0.343)
NON $ imes$ Global	0.017*	0.053**	0.663*	0.374
	(0.02)	(0.014)	(0.141)	(0.725)
NON $ imes$ Emerging	0.009**	0.025*	0.595***	0.641**
	(0.004)	(0.011)	(0.254)	(0.249)
NON $ imes$ African	-0.025**	-0.110**	0.255	-0.404
	(0.012)	(0.038)	(0.671)	(0.528)
Global	0.019***	0.046**	0.292	0.341
	(0.007)	(0.022)	(0.216)	(0.525)
Emerging	0.008**	0.031*	0.220**	0.107
	(0.03)	(0.011)	(0.109)	(0.198)
African	-0.010**	-0.064	0.073	-0.098**
	(0.005)	(0.025) *	(0.034)	(0.039)
CAR	0.132***	0.278**	5.704***	1.448
	(0.037)	(0.133)	(1.624)	(1.009)
SIZE	0.010***	0.056***	0.976***	0.703***
	(0.003)	(0.016)	(0.150)	(0.133)
OPC	-0.808***	-1.343***	-6.543***	-3.820***
	(0.135)	(0.497)	(2.844)	(1.442)
GDPG	0.000	0.002	0.036**	0.023
	(0.000)	(0.002)	(0.015)	(0.015)
INF	0.001***	0.004***	0.035***	0.027***
	(0.000)	(0.001)	(0.010)	(0.008)
DBI	0.000	0.001	0.030**	-0.010
	(0.000)	(0.003)	(0.015)	(0.013)
Constant	-0.125	-1.149*	-3.496***	0.000
	(0.098)	(0.566)	(1.443)	(0.000)
Time effect	Yes	Yes	Yes	Yes
Country effect	Yes	Yes	Yes	Yes
AR (2)	0.456	0.355	0.612	0.266
Sargan p-values	0.2474	0.159	0.5787	0.476
Observations	2895	2837	2631	2544

Note: Standard errors in parentheses. * p < 0.1, ** p < 0.05, *** p < 0.01.

ownership dummies are presented in Table 4. As expected, the interaction of the NON variable and the Global and Emerging banks dummies significantly and positively impacts bank performance as compared to the domestic banks. Similarly, the interaction of the share of non-interest income and the regional African banks dummy significantly and positively affects their performance compared to the domestic banks.

5. Conclusion and Recommendation

We analyze the effect of foreign bank ownership and income diversification on bank performance and how income diversification affects different groups of foreign banks in sub-Saharan Africa. We compare the diversification benefits of three different categories of foreign banks to the group of local banks in sub-Saharan Africa: regional African banks, global banks from developed countries, and banks from non-African emerging economies. We use the two-step System Generalized Method of Moment approach to model annual bank data across 46 countries in Sub-Saharan Africa over the period 2011–2018. Our sample contains 193 local banks, 181 regional African banks, 69 Global banks, and 24 banks from emerging countries.

The results of the study show that increased income diversification enhances banks performance. Specifically, a shift from interest-yielding income to non-interest income activities results in bank gains regarding profits and risk-adjusted profits of banks in Sub-Saharan Africa. Our finding clearly shows the role of income diversification in improving the performance of banks. The results also show that there exist significant differences across the foreign bank ownership groups. The results indicate that regional African banks have significantly lower ROA and RAROA compared to the reference domestic banks while being a Global bank is associated with higher ROA, ROE and RAROA than that of the domestic banks. The Emerging country banks have significantly higher ROE and RAROE than that of the domestic banks. The results imply that the Global banks tend to outperform the Regional African banks, the Emerging country banks and the domestic reference banks. The Emerging banks also outperform the Regional African banks while the domestic banks perform better than the African banks. Regarding how different foreign banks benefit from income diversification, we find that Global banks benefit from diversification more than their counterparts operating in the region. The Emerging country banks also outperform the African and domestic banks when they diversify their income sources. Our results also reveal that local banks in the region benefit from income diversification more than the regional African banks. The results of this study suggest that the emerging banks and the regional African banks do not always exhibit similar features as the Global banks, so it may be misleading to consider the homogenous impact of all foreign banks.

The outcome of the study provides significant ramifications for international banking. The study results highlight that advancing the focus on non-interest income sources provides diversification gains to banks, particularly more to the Global banks and the Emerging country banks. The Global and Emerging banks may have more sophisticated technology and other resources than their regional African counterparts, which may not have the resources required to be more competitive in non-traditional banking activities. The higher diversification gains by the Global and Emerging banks may also be related to higher levels of operational capacity embedded in their organization, allowing them to benefit from lower operating and funding costs. Thus, the regional African banks and the domestic banks could share in the experience of the Global and Emerging banks, which

are mostly from developed countries with a better experience in financial innovation and non-traditional banking business. The current study excludes cultural differences and accounting handling that may account for differences observed in the study because of data non-availability. Future studies may look into the roles of cultural differences and accounting handling in the differing income diversification gains observed in this study when information on those factors become available. Future studies could also examine how market power helps the Global and Emerging banks in reaping diversification benefits. Future studies may also address why regional African banks survive despite under-performance and relatively lower gains from bank income diversification compared to the other two groups of foreign and domestic banks.

Data availability statement

The data used in this study were obtained from two sources and the respective data availability statements are as follows: The bank-level and industry data were sourced from BvD BankFocus database and restrictions apply to the availability of these data. The macroeconomic variables were sourced from World Development Indicator of World Bank openly available at https://databank.worldbank.org/data/source/world-development-indicators

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Appendix

Table A1:	Means of	selected	bank	variables	bv	country
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Country	DIV	CAR	OPC	SIZE	ROA	ROE	RAROA	RAROE	# Banks
Angola	0.434	0.161	0.066	13.582	0.023	0.175	1.262	1.790	20
Benin	0.545	0.064	0.034	13.182	0.002	0.053	0.941	0.801	8
Botswana	0.459	0.123	0.039	13.021	0.017	0.172	1.883	1.911	11
Burkina Faso	0.597	0.090	0.032	13.186	0.011	0.153	2.414	2.591	12
Burundi	0.419	0.147	0.054	11.848	0.027	0.192	1.850	1.936	5
Cameroon	0.451	0.096	0.050	13.325	0.013	0.181	2.740	2.270	11
Cape Verde	0.315	0.087	0.028	12.506	0.005	0.074	1.011	1.077	7
Cent Afri Rep	0.471	0.154	0.072	11.638	0.010	0.064	0.921	0.926	2
Chad	0.270	0.120	0.047	12.364	0.019	0.162	2.118	2.380	5
Congo	0.497	0.080	0.054	12.933	0.011	0.158	1.642	1.537	2
Congo DR	0.535	0.160	0.092	12.513	0.004	0.061	1.525	1.645	12
Cote Divoire	0.569	0.106	0.050	13.022	0.007	0.155	2.934	2.951	19
Equat Guinea	0.172	0.215	0.085	12.496	0.003	0.116	3.354	2.249	2
Ethiopia	0.577	0.144	0.036	13.315	0.034	0.261	6.070	6.662	14
Gabon	0.502	0.114	0.056	13.052	0.026	0.200	2.526	2.444	6
Gambia	0.592	0.124	0.058	11.468	0.033	0.307	2.980	3.047	4
Ghana	0.441	0.180	0.074	12.931	0.034	0.226	2.753	2.745	24
Guinea	0.520	0.130	0.062	11.945	0.029	0.257	3.923	4.135	8
Guinea-Bissau	0.682	0.133	0.065	11.557	0.012	0.089	0.922	0.907	1
Kenya	0.423	0.182	0.049	13.280	0.022	0.134	2.818	2.732	33
Lesotho	0.501	0.116	0.078	12.160	0.029	0.227	2.996	2.234	4
Liberia	0.533	0.160	0.077	11.632	0.008	0.026	2.903	2.921	3
Madagascar	0.557	0.112	0.046	12.729	0.034	0.321	4.374	6.158	6
Malawi	0.540	0.153	0.102	12.322	0.039	0.208	1.826	1.732	6
Mali	0.618	0.100	0.042	13.005	0.015	0.152	2.965	2.858	11
Mauritania	0.525	0.244	0.045	11.796	0.005	0.010	2.724	2.687	10
Mauritius	0.347	0.198	0.028	13.796	0.003	0.084	2.043	2.341	18
Mozambique	0.472	0.191	0.084	12.784	0.007	0.061	1.533	1.921	14
Namibia	0.463	0.221	0.051	13.905	0.019	0.193	6.721	7.117	8
Niger	0.634	0.103	0.043	12.548	0.015	0.144	2.983	3.380	7
Nigeria	0.391	0.157	0.051	15.051	0.013	0.115	2.345	2.635	23
Rwanda	0.349	0.168	0.073	12.070	0.009	0.077	3.492	2.507	11
Sao Tome & P.	0.514	0.154	0.094	11.546	0.023	0.152	4.773	5.209	1
Senegal	0.577	0.120	0.045	12.741	0.008	0.094	1.769	2.195	21
Seychelles	0.531	0.092	0.029	12.744	0.033	0.367	4.861	5.356	3
Sierra Leone	0.563	0.124	0.086	11.373	0.033	0.332	3.652	3.929	7
Somalia	0.656	0.127	0.085	11.013	0.022	0.171	1.652	1.622	1
South Africa	0.406	0.134	0.061	14.316	0.007	0.106	4.032	5.056	17
South Sudan	0.536	0.222	0.058	11.249	0.044	0.201	2.202	1.311	4
Sudan	0.483	0.124	0.053	12.491	0.017	0.165	2.499	2.285	2
Swaziland	0.543	0.158	0.062	12.661	0.036	0.283	6.758	5.331	4
Tanzania	0.421	0.171	0.075	12.352	0.008	0.080	2.134	1.714	31
Тодо	0.599	0.054	0.041	12.857	0.003	0.195	0.944	1.058	7
Uganda	0.452	0.186	0.074	12.232	0.018	0.114	2.841	2.304	18
Zambia	0.518	0.169	0.070	12.700	0.027	0.183	2.471	2.830	15
Zimbabwe	0.534	0.169	0.090	13.001	0.022	0.176	1.264	1.397	9

Note: DIV = HHI measure of income diversification; CAR = Capital adequacy ratio; OPC = operating cost; SIZE = bank size; ROA = Returns on Assets; ROE = Return on equity; RAROA = Risk-adjusted return on assets; RAROE = Risk-adjusted return on equity.