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Income Diversification and Banks' Profitability from an African Market Perspective: A Relief for SMEs?

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Introduction

The last two decades have witnessed many firms particularly small and medium enterprises (SMEs) around the globe struggling for corporate business attention. Financial institutions and especially banks have instead increased business diversification. Initiatives considered to have contributed to this shift in business focus include the so-called Volcker rule in the United States, the proposals of the Vickers Commission in the United Kingdom and the European Commission's Liikanen Report. Draft legislation on structural bank regulation is underway in Germany and France (Gambacorta and van Rixtel 2013; Viñals et al. 2013), Glass-Steagall Act allowed US commercial banks to reduce business risk by diversifying into non-traditional financial services. The African continent has not been spared of this paradigm shift. In the early 1990s, many developing economies in an attempt to attain economic resilience have witnessed the gradual but noticeable liberalization of its financial sector.

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These financial reforms are assumed to have shifted the attention to the generation of non-traditional income in the form of fees, transaction fees, annual and monthly account service charges, inactivity fees, check and deposit slip fees and so on in many African countries. However, the empirical relevance of income diversification on banks' profitability in African market appears not only inadequate but mixed. The association between income diversification and banks' profitability is anchored in two important theories (strategic focus and conglomeration). Contenders of the strategic focus hypothesis maintain that firms can maximize value by focusing on core businesses and core competencies. In contrast, proponents of the conglomeration hypothesis argue that owning and operating a broad range of businesses can add value from exploiting cost scope economies by sharing inputs in joint production (e.g., Teece 1980) or taking advantage of revenue scope economies in providing "one-stop shopping" to consumers who are willing to pay for the extra convenience of financial super-markets (e.g., Herring and Santomero 1990; Gallo et al. 1996; Calomiris 1998). These contradictory theories seem to suggest that there is a non-linear relationship between income diversification and banks' profitability or performance. Extreme and excessive diversification may result in increased cost over and above any perceived benefits (Riordan and Williamson 1985; Grant et al. 1988; Berger and Ofek 1995; Jensen 1996).

The present chapter will not only attempt to estimate the impact of income diversification on banks' profitability with a special focus on African banking market but also tests the existence of non-linear relationship if any between income diversification and banks' profitability. If income diversification is found to be beneficial, will banks in Africa continue to generate income from traditional incomes by extending more credits to firms? Will this provide a relief for firms particularly SMEs. Categorically, this study extends and contributes to literature in four ways. First, Mercieca et al. (2007) examined the effect of non-interest income on profitability from a European perspective. A total number of 755 banks between 1997 and 2003 were employed. Contrary to related studies, the present study mimics the study of Mercieca et al. (2007) from an African perspective and covers about 584 banks and well-functioning internationally active banks with various specializations headquartered in 50 African countries spanning from 2001 to 2013. This

allows better understanding of the channels by which increased non-interest income and diversification impact banks' profitability. Second, the study takes into account differences in macroeconomic significance, structural factors, sample split to take care of potential endogeneity between income diversification and banks' profitability. Third the study also estimates how banks' profitability responds to variations in income diversification under various changes of economic conditions: stable, improved economic conditions and worst financial crisis, that is, before and after recent global financial crisis (GFC). Finally, while majority of related studies focused on developed countries, few studies found in the subregion employ parametric measures to estimate cost and profit efficiency. The present study uses random effects technique and financial ratios as proxies for bank profitability.

The focus on Africa was unhurried. Developments in African banking industry provide an amazing background for such investigations for the following reasons. Nyantakyi et al. (2015) concur that in the mid-1980s, many African countries implemented financial sector reforms. These reforms were largely focused at restructuring and privatizing state controlled banks as part of the IMF and World Bank structural adjustment policies (SAP). Other auxiliary policies such as interest and capital controls targeted to overhaul the supervisory and regulatory frameworks in the banking sector were also introduced. Africa's banking environment is relatively shallow and less penetrated and more competitive as those in high-income regions. The continent has made improvements in banking technology and is well regulated (Nyantakyi et al. 2015). Table 8.1 presents revenue and profitability indicators in Africa's banking industry.

In Table 8.1, the industry strongly depends on revenue from traditional banking activities in lending. This suggests that as far as Africa's banking environment is concerned, a high percentage of banks' revenue is generated from interest income from loans and advances as compared to the revenue from non-traditional activities. From the study period, while the profit indicators particularly return on assets averaged 1.5 percent, return on equity averaged 10.28 percent between 2001 and 2013. Within the same period, the average banks' expenditure stood at 64.51 percent of the total bank income. The market concentration proxied by Herfindahl index of the banks' major balance sheet items in assets and loans is displayed in Table 8.1. The Herfindahl-Hirschman index (HHI)

Table 8.1 Structure of the banking industry

Revenue and profitability indicators	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Average
Return on assets	0.0134	0.0103	0.0123	0.0173	0.0164	0.0221	0.0181	0.0164	0.0091	0.0120	0.0130	0.0153	0.0166	1.4806
Return on equity	−0.0153	−0.1314	0.1413	0.1471	0.0903	0.1402	0.1436	0.2123	0.1010	0.1236	0.1198	0.1226	0.1422	10.2875
Cost to income ratio	0.6081	0.6752	0.5891	0.6156	0.6441	0.6306	0.6232	0.6384	0.6704	0.6926	0.6783	0.6998	0.6213	64.5131
Interest income	0.7121	0.7561	0.7601	0.7962	0.7763	0.8267	0.8164	0.8291	0.8164	0.8006	0.8632	0.7235	0.7782	78.8838
Non-interest income	0.2119	0.2011	0.1871	0.1871	0.1151	0.1762	0.1345	0.1352	0.1572	0.1796	0.2521	0.2153	0.2241	18.2808
Herfindahl index														
Loans	2230	2024	1935	4731	3676	3661	3824	3771	3798	4011	3506	3705	3316	
Assets	4405	4280	3898	8479	6568	6753	6970	7069	6725	7222	6468	6878	6296	
Deposit	3286	3184	3143	4286	6131	5255	5205	5402	4285	5049	4322	4574	3064	

Source: Author's estimate (2017)

which is a commonly accepted measure of market concentration can range from 0 to 10,000. Studies have shown that an HHI of 2500 or greater is considered to be a highly concentrated marketplace. In Table 8.1, the African banking industry could be considered as a competitive financial sector.

The chapter is structured as follows: The next section provides an overview of the relevant empirical literature on income diversification and banks' profitability. Section "Methodology" discusses the methodology employed in the analysis. While section "Data" presents the data, section "Discussions of Empirical Results" presents the empirical results of the study. The final section covers the conclusion and policy recommendation from the findings of the study.

Literature Review

The empirical association between income diversification and banks' profitability is not only a topic of active research but debated in several developed markets with mixed findings. Among the identified benefits are economies of scope (e.g., Chandler 1977; Teece 1982), an improved resource allocation through internal capital markets (e.g., Williamson 1975; Stein 1997), a potentially lower tax burden due to higher financial leverage (e.g., Lewellen 1971) and the ability to use firm-specific resources to extend a competitive advantage from one market to another (e.g., Bodnar et al. 1997). Proponents of diversification further suggest that diversified banks can benefit from leveraging managerial skills and abilities across products and geographic regions (Iskandar-Datta and McLaughlin 2007). Baele et al. (2007) concur that a positive relationship exists between diversification and franchise value using a sample of 17 European countries. Chronopoulos et al. (2011) also examined the diversification-efficiency relationship for new member states admitted into the European Union between 2001 and 2007. The findings reveal a strong evidence to support the hypothesis that bank income diversification is efficiency enhancing. Lee et al. (2014) employ a panel data of banks in 29 Asia-Pacific countries from 1995 to 2009 to analyze the effect of bank income diversification on performance. Lee et al. (2014)

study confirms a positive impact of income diversification in respect of countries with bank-dominated financial systems. Depending on the degree of relatedness of a firm's diversification activities, diversification generates multiple outcomes (Palich et al. 2000; Qian 2002). Grossmann (2007) submits that diversification may be a means to expand the firm's boundaries in the presence of the internal coordination problems that naturally arise in large firms. Meslier et al. (2014) empirical investigation over the 1999–2005 period using a sample of 39 universal and commercial banks in the Philippines with a very detailed breakdown of annual data on income structure provided by the Central Bank of the Philippines. The study concludes that income diversification and a shift toward non-interest income has a positive influence on the profitability and risk-adjusted profitability of Philippine banks. This result is consistent with Sanya and Wolfe (2011) and Pennathur et al. (2012), who find revenue diversification to be beneficial to banks in emerging economies.

Having considered the positive impact of income diversification and banks' performance, other studies have also found evidence of a negative effect of diversification on bank performance. Diversified banks can suffer from diluting the comparative advantage of management by going beyond their existing expertise (Klein and Saidenberg 1998), diversification-inducing competition (Winton 1999) and increased agency costs resulting from value-decreasing activities of the managers who have lowered their personal risk (Amihud and Lev 1981; Laeven and Levine 2007; Deng and Elyasiani 2008). Cost may stem from agency problems afflicting diversifying investments (e.g., Jensen 1986; Meyer et al. 1992), inefficient internal resource allocation due to a malfunctioning of internal capital markets (e.g., Lamont 1997; Scharfstein 1998; Rajan et al. 2000), informational asymmetries between head office and divisional managers (e.g., Harris et al. 1992) and increased incentives for rent-seeking behavior by managers (e.g., Scharfstein and Stein 2000). Acharya et al. (2002) report that diversification of loans does not typically improve performance or reduce risk in Italian banks. Morgan and Katherine (2003) examine geographic diversification and find similarly negative results: diversification is not associated with greater returns (ROE or ROA) or reduced risk. Stiroh (2005) shows that increased exposure to non-interest income increases the volatility of equity market

returns, but not the mean. Vennet (2002) employed stochastic frontier analysis (SFA) on a sample of European banks between 1995 and 1996 and found that specialized banks have high efficiency in cost and profit compared to diversified banks. Stiroh and Rumble (2006) report that increased reliance on non-interest income activities is associated with increased risk and lower return. According to Jones and Hill (1988), diversification beyond a certain degree raises internal governance and administration costs to the point that performance suffers. Elyasiani and Wang (2012) investigated the effect of income diversification on production efficiency of bank holding companies from 1997 to 2007 and established a statistically significant negative relationship with income diversification. Deng et al. (2007) also provided evidence on the negative effect of income diversification on firm performance by finding an inverse relationship between cost of debt and diversification activities of bank holding companies. The mixed results require further empirical work. Thus, the study hypothesizes the following relationship:

H1 *There is a negative relationship between income diversification and banks' profitability.*

The early industrial organization literature argued that no significant relationship exists between diversification and performance (see e.g., Arnould 1969; Markham 1973). Most studies find support in a curvilinear relationship between diversification and profitability (for a review, see Palich et al. 2000; see also Yigit and Berham 2013). Gambacorta et al. (2014) analyzed the non-linear relationship between income diversification and banks' profitability using an international sample of 98 banks from 27 countries over the period 1994–2012. The authors find evidence of an inverted U-shaped relationship. Specifically, the authors found that beyond 30 percent of diversification ratio, diversification become less profitable. Alhassan (2014) employs a stochastic frontier analysis (SFA) technique to examine 26 Ghanaian banks from 2003 to 2011 and establishes the non-linear relationship between income diversification and efficiency. The present study therefore hypothesizes as follows:

H2 *There is a non-linear relationship between income diversification and banks' profitability of banks in Africa.*

The reviewed literatures paint a mixed and inconclusive picture about income diversification and banks' profitability relationship. From the literature reviewed and the financial reforms initiated, it appears many banks in African countries have shifted focus to non-interest generating activities. Following the perceived shift in business model, it is essential that attention is paid to the effect of growing non-traditional banking activities on banks' profitability. This study makes several contributions to empirical literature and departs from the related studies as follows: first, most studies on income diversification and banks' profitability have focused on developed countries such as the United States and Europe, where the impact differs leaving relatively little empirical evidence on the African market. In Africa, studies that have come close to this present study or advanced knowledge on income diversification and banks' profitability nexus include Mlambo and Ncube (2011), Aboagye (2012), Saka et al. (2012), Isshaq and Bokpin (2012), Bokpin (2013) and Alhassan (2014). These studies have all yielded mixed and inconclusive evidence on the effects of income diversification. The present study adds to the call on income diversification and banks' profitability nexus using 584 large banks and well-functioning internationally active banks with various specializations headquartered in 50 African countries. Second, in terms of methodology, the studies have utilized several alternative measures to income diversification. Laeven and Levine (2007) apply a modification of the Lang and Stulz (1994) "chop shop" method to measure diversification effects on bank value. Gambacorta et al. (2014) analyze the non-linear link between income diversification and banks' performance using return on assets (ROA) as dependent variable. The present study does not only mimic the Gambacorta et al. (2014) empirical work but it includes additional explanatory variables in our regressions to avoid potentially omitted variable biases. Third, apart from inconclusive results in the literature, the empirical evidence documented in the banking literature is based mainly on linear models. The study under review further investigates the existence of non-linear relationship between income diversification and bank profitability in the African banking environment.

Finally, the focus on African banking industry is particularly interesting. This is because over the past two decades the African banking environment has experienced political and economic regime shifts which have influenced domestic policies and series of financial reforms.

Methodology

To investigate income diversification effects on banks' profitability, there is the need to have a consistent framework that ties banks' values to observable financial indicators. This section presents the framework that supports the empirical analysis.

Empirical Model

The study employs a multi-staged analysis. The first stage uses random effect estimation to estimate the impact of income diversification on banks' profitability. In the second stage analysis, the study explores the quadratic term of the non-linearity of the variable term test. Stated differently, the turning point of the relationship. Empirically, random effect estimation is used to explore the relationship between income diversification and banks' profitability. The empirical specification focuses on the reported profitability measured as return on assets (ROA) which is assumed to be a function of the desired various bank-specific characteristics and macroeconomic indicators as shown in Eq. (8.1):

$$ROA_{it} = F\left(X_{it}Y_{it}Z_{it}\varepsilon_{it}\right) \tag{8.1}$$

where ROA_{it} is the dependent variable, X_{it} is a vector of bank-specific variables which are the independent variables, Y_{it} is a vector of employment variables used as control variables in the second model and Z_{it} are macroeconomic variables which are also controlled in the first model. ε_{it} represents the residual term which includes all other market imperfections and regulatory restrictions which may affect ROA but not captured in our expression. The study employs a multi-staged analysis. The first

stage uses the random effect to estimate the impact of income diversification on banks' profitability. Specifically, the study employed the following variables: dependent (Return on assets), independent variables (Pretax profit, Impairment charges, Equity to assets, Cost income, Diversification ratio, Gross loans, Loan to total assets), macroeconomic indicators (Inflation Exchange rate, Real interest rate) and a control variable (Specialization). A formal expression for the relationship to be estimated is given in Eq. (8.2):

$$ROA_{it} = a_0 + \beta_1 DIV\_Ratio_{it} + \beta_2 \Pr txpr_{it} + \beta_3 Im\,paim_{it}$$

$$+ \beta_4 GrL_{it} + \beta_5 Coin_{it} + \beta_6 Eq\_TAs_{it} + \beta_7 Lo\_TAs_{it} \qquad (8.2)$$

$$+ n_1 Spec\_t_{it} + \varphi_1 INF_{it} + \varphi_2 EX_{it} + \varphi_3 RINT_{it} + \varepsilon_{it}$$

The second stage analysis attempts to test the existence of non-linearity relationship of these variables. The study explores the quadratic term of the non-linearity of the variable term. Stated differently, the turning point of the relationship. The quadratic equation is any equation having the form:

$$ax^2 + bx + c = 0 \qquad (8.3)$$

where x represents an unknown and a, b and c represent known numbers such that a is not equal to 0. If $a = 0$, then the equation is linear, not quadratic. a, b and c are quadratic coefficient, the linear coefficient and the constant or free term, respectively. A formal expression for the relationship to be estimated is given in Eq. (8.2):

$$ROA_{it} = a_0 + \beta_1 DIV\_Ratio_{it} + \beta_2 DIV\_Ratio_{it}^2 + \beta_3 \Pr txpr_{it}$$

$$+ \beta_4 Impaim_{it} + \beta_5 GrL_{it} + \beta_6 Coin_{it} + \beta_7 Eq\_TAs_{it} + \beta_8 Lo\_TAs_{it} \qquad (8.4)$$

$$+ n_1 Spec\_t_{it} + \varphi_1 INF_{it} + \varphi_2 EX_{it} + \varphi_3 RINT_{it} + \varepsilon_{it}$$

Data

The study carefully selected bank-specific data from the Bankscope database. Since Bankscope mostly covers all existing large banks, coverage for small banks is heterogenous across countries, space and time. To control the selection biases, the study focused on a criterial in selecting the total assets of the sampled banks. The final sample contains about 584 large banks and well-functioning internationally active banks with various specializations headquartered in 50 African countries spanning from 2001 to 2013. Besides banks with the history of merger and acquisitions were duly followed and considered. The 584 banks and well-functioning internationally active banks were grouped into the following: commercial banks, investment banks, Islamic banks, multilateral government banks, real estate and mortgage banks, cooperative banks and savings banks. The macroeconomic variables were the World Bank database between 2001 and 2013. Bank specialization was a dummy variable assuming the value 0 if the bank is predominantly for government and non-government controlled banks respectively and 1 if the bank is under government control.

Definition of Diversification and Measurements

Gambacorta et al. (2014) defined and measured diversification as non-interest income to total income. Various authors have applied a closely related approach (see, e.g., Comment and Jarrell 1995; Acharya et al. 2006; Stiroh and Rumble 2006) to measure income diversification. However, like other related studies such as Leaven and Levine (2007), Chronopoulos et al. (2011), Elyasiani and Wang (2012), Alhassan (2014), Morgan and Katherine (2003) and Stiroh (2004) and Thomas (2002), the present study uses the Herfindahl-Hirschman index (HHI) approach to measure bank income diversification expressed as:

$$DIV = 1 - \left(PROP^2_{non} + PROP^2_{net} \right) \tag{8.5}$$

where PRO^2_{non} is the proportion or share of net operating revenue from non-interest income sources and $PROP^2_{net}$ is the proportion or share of net operating revenue from net interest sources.

$$PROP_{non} = \frac{non}{net + non}$$

$$PROP_{net} = \frac{net}{net + non}$$

(8.6)

DIV measures the degree of diversification. A higher value indicates a more diversified mix: 0.0 means that all revenue comes from a single source (complete concentration), while 0.5 is an even split between net interest income and non-interest income (complete diversification).

Definition of Other Variables

The study employs the following (annual) variables obtained from Bankscope and other sources for the banks in our sample over the period 2001–2013. The present study uses return on assets (ROA) and pretax profit as performance measure to capture the effects of bank-specific factors on banks' profitability. Keeton and Matsunaga (1985) argue that ROA is a superior indicator of calculating banks' profitability since it measures how profitably and efficiently management uses its assets. The following empirical studies have adopted ROA as an adequate indicator of measuring banks' profitability: Haron (2004), Hassan and Bashir (2003), Bashir (2001), Demirgüç-Kunt and Huizinga (1998), Naceur (2003), Alkassim (2005) and Alrashdan (2002). Other bank-specific measures include risk measures (impairment charges, equity to assets and cost income), size measures (gross loans and loans to total assets) and ownership measures (government and non-government shares). Mullineaux (1978) and Hester and Zoellner (1966) studies found that changes in balance sheet items affect banks' profitability significantly. Heggestad (1977) notes that liability items and assets items have an adverse and positive impact on profitability, respectively. While Emery (1971) finds a positive impact on profitabilit, Heggestad (1977), Smirlock (1985) and Kwast and Rose (1982) found no relationship between these

indicators. For variables not under the management control, the study considered includes exchange rate, real interest and inflation. Inflation measured by the percentage increase in consumer price index. Haron and Azmi (2004) and Staikouras and Wood (2003) confirmed that inflation impacts positively on profitability. Bourke (1989) and Molyneux and Thornton (1992) empirically tested Revell's (1979) findings which suggested that banks' profitability responds positively to variations in inflation. Studies by Bourke (1989), Claeys and Vander (2008), Demirguc-Kunt and Huizinga (1998), García-Herrero et al. (2009) and Molyneux and Thornton (1992) also confirm the positive relationship of these variables. Avkiran (2009) notes that interest rates negatively affect commercial banks' profitability. Banks' specialization considered and used as a proxy banks' area of expertise is introduced as a dummy variable. The unit of analysis (Banks) is considered because banks dominate the financial industry in Africa and their importance has been enumerated in countless research works (see Edwards 1987; Levine 1997, 1999; Sinkey 1992). The sample chosen is a representative of the population and big enough to permit reasonable analysis of data. The banking industry was chosen due to its important and special role in every economy (Levine 1997).

Discussions of Empirical Results

Descriptive Statistics

The definition and summary statistics of the variables used in Eq. (8.2) are presented in Table 8.2. Generally, with an average observation of 4093, the study observes that there is no wide variation across the sample. This implies that most of the variables have their observations clustered around the means. This provides an indication that the sector is not widely spread and evenly distributed. Specifically, the average return on assets (ROA) for African banks records a mean value of 10.47 percent and a standard deviation of 4.16 percent with minimum and maximum values of −63.9730 and 103.4730, respectively. This seems to suggest that banks in African markets generate 10.47 percent returns between 2001 and 2013. In terms of independent indicators, the study finds less

variation in all the variables. A key component of our analysis is that of income diversification (DIV_Ratio). The summary statistics as shown in Table 8.2 portrays a less variation across the periods under study. An average revenue diversification measure (DIV_Ratio) had a mean of 4.00 and standard deviation of 0.23. This indicates that the banking industry in Africa is able to attain only 4.00 percent of their potential non-interest revenue. Results obtained indicate that, indeed, the rest of independent variables i.e. Prtxpr, Impairm, Eq_TAs, Coin GrL, Lo_TAs, INF, EX, RINT and macroeconomic variables are not different in terms their means and spread. In the same period, the study found a similar result for the dummy variable (specialization). The study further carried out several specifications tests to give credence to the findings of the study. These include the auxiliary regressions, correlation matrix, eigenvalues and condition index. However, this study applies both the correlation matrix and variance inflation factor (VIF). Results of variance inflation factor (VIF), unit root tests and Hausman specification tests are presented in the Appendices 1, 2 and 3, respectively.

From the correlations matrix in Table 8.2, the result shows that the correlation between all independent variables was examined in order to determine the extent to which the independent variables are related to each other. When the correlation between any two independent variables is too high (±0.90 and above), it may result in multicollinearity. Using the threshold of 0.70 as suggested by Kennedy (2008), the estimation of the regression models would not be biased by multicollinearity. Clearly, it was found out that although some of the correlations are significant, none of the coefficients exceed 0.7, showing that all the explanatory variables can be used in the estimations. With an average total of 4093 observations, it is convenient to proceed with stationarity tests. Appendix 2 displays the results of the Fisher-type unit root test for stationarity. The four tests employed (inverse-chi-squared test (P), inverse normal (Z), inverse logit (L*) and modified inv.chi-squared (PM)) all rejected the null hypothesis of the presence of unit roots in all panels at least at 1 percent. All the variables used are therefore stationary and appropriate in carrying out the panel estimation.

Income Diversification and Banks' Profitability

The results of the study are displayed in Table 8.3. Econometrics theory has highly recommended random effect (RE) estimation technique for panel datasets that are not balanced since its results are more efficient than fixed effect (FE) estimates as confirmed by the Hausman test. Our primary goal is to investigate the impact of income diversification and banks' profitability. Estimates are done in two ways. The first stage uses Eq. (8.2) to estimate the impact of income diversification on banks' profitability. In the second stage, the study explores the quadratic term of the non-linearity of the variable term. Stated differently, the turning point of the relationship.

The first stage empirical results are presented in Table 8.3 (Model 1). Specifically, a negative relationship is found between income diversification and banks' profitability at 1 percent significant level. This implies that diversified banks in Africa are less profitable. This result is not consistent with conglomeration hypothesis which argues that owning and operating a broad range of businesses can add value from exploiting cost scope economies by sharing inputs in joint production (e.g., Teece 1980). Besides, this result invalidates the empirical works of Iskandar-Datta and McLaughlin (2007), Baele et al. (2007), Lee et al. (2014), Chandler (1977), Williamson (1975) and Stein (1997). All identified benefits in terms of economies of scope, an improved resource allocation through internal capital markets, a potentially lower tax burden due to higher financial leverage and the ability to use firm-specific resources to extend a competitive advantage from one market to another. However, the results support the proponents of the strategic focus hypothesis which argues that firms can maximize value by focusing on core businesses and core competencies. The result also finds support in the works of Acharya et al. (2002), Stiroh (2005), Vennet (2002) Stiroh and Rumble (2006), Hill and Snell (1988) and Elyasiani and Wang (2012). All these studies have shown that increased exposure to non-interest income increases the volatility of market returns.

In the second stage of the analysis, the Eq. (8.4) is applied to examine the non-linear relationship between income diversification and banks' profitability. The study introduces the quadratic term of diversification,

Table 8.2 Definition of variables, summary statistic and expected signs

	Proxy	Definition	Notation	ROA	Prtxpr	Impairm
Description statistics						
Mean				10.4726	38,520	11.7698
Standard dev.				4.1603	148,303	2.1362
Min				−63.9730	−3,299,997	1.1294
Max				103.4732	1,800,003	18.8802
Observation				4122	4122	4022
Expected sign					+	+
Correlation						
	Performance measures	Return on assets	*ROA*	1.0000		
		Pretax profit	*Prtxpr*	0.3399	1.0000	
				0.0000		
	Risk measures	Impairment charges	*Impairm*	−0.1452	0.5900	1.0000
				0.0000	0.0000	
		Equity to assets	*Eq_TAs*	0.3594	−0.1384	−0.2036
				0.0000	0.0000	0.0000
		Cost income	*Coin*	−0.2727	−0.3670	−0.1902
				0.0000	0.0000	0.0000
		Diversification ratio	*DIV_Ratio*	0.0063	0.4227	0.2843
				0.7066	0.0000	0.0000
	Size measures	Gross loans	*GrL*	−0.0783	0.4338	0.4120
				0.0000	0.0000	0.0000
		Loan to total assets	*Lo_TAs*	−0.0625	0.0702	0.1106
				0.0002	0.0000	0.0000
	Macro economic indicators	Inflation	*INF*	0.1562	−0.0436	−0.0870
				0.0000	0.0089	0.0000
		Exchange rate	*EX*	−0.0547	0.0713	0.0376
				0.0010	0.0000	0.0220
		Real interest rate	*RINT*	0.0221	−0.1663	−0.1208
				0.1813	0.0000	0.0000
	Control variable	Specialization	*Spec_t*	0.0064	−0.0953	−0.0298
				0.6981	0.0000	0.0697

Source: Author's estimate (2017)

Eq_TAs	Coin	DIV_Ratio	GrL	Lo_TAs	INF	EX	RINT	Spec_t
4.4473	5.0442	3.8999	13.9255	0.0810	7.8820	5.6776	7.3205	1.3236
0.6276	0.5016	0.2382	2.0691	0.7463	0.9216	0.2979	10.8304	0.9292
1.3461	0.0138	1	2.8517	−8.9075	1.5776	5.0567	−28.4016	1.0000
6.6035	7.8388	4.9890	20.1462	0.9535	12.5912	7.9327	252.1150	7.0000
4087	4122	4121	4022	4121	4014	4122	4122	4122
+	−	+	+	+	−	+	+	−

Eq_TAs	Coin	DIV_Ratio	GrL	Lo_TAs	INF	EX	RINT	Spec_t
1.0000								
0.0224	1.0000							
0.1525								
−0.2011	−0.2247	1.0000						
0.0000	0.0000							
−0.1627	−0.0610	0.0979	1.0000					
0.0000	0.0001	0.0000						
−0.0729	−0.0160	0.1818	0.0788	1.0000				
0.0000	0.3039	0.0000	0.0000					
0.1204	0.0475	−0.0451	−0.0380	−0.1688	1.0000			
0.0000	0.0026	0.0047	0.0171	0.0000				
−0.0545	0.0043	0.0183	0.0190	−0.0354	0.1189	1.0000		
0.0005	0.5826	0.2458	0.2278	0.0230	0.0000			
0.0346	0.1005	−0.0682	−0.0540	−0.0780	0.0494	0.0043	1.0000	
0.0269	0.0000	0.0000	0.0006	0.0000	0.0017	0.5848		
0.1631	0.0139	−0.0186	−0.0475	−0.0139	0.0609	−0.0314	−0.0081	1.0000
0.0000	0.3734	0.2380	0.0025	0.3719	0.0001	0.0440	0.6022	

Table 8.3 Results of random effect estimation

Variable	Model 1		Model 2	
	Linear model		Quadratic model	
	Coefficient	Z-value	Coefficient	Z-value
DIV_Ratio	−0.7680***	−5.2500	−2.0184***	−8.5100
	(0.1462)		(0.2371)	
DIV_Ratio^2			−0.5840***	−4.5100
			(0.1296)	
Prtxpr	0.4380***	26.7800	0.4736***	26.4200
	(0.0164)		(0.0179)	
Impairm	−0.2293***	−18.8900	−0.2192***	−18.8500
	(0.0121)		(0.0116)	
GrL	−2.3000***	−0.9829	−0.2640***	−10.2724
	(2.3400)		(0.0257)	
Coin	−0.2315***	−5.6600	−0.2080***	−5.1800
	(0.0409)		(0.0401)	
Eq_TAs	0.4985***	18.7800	0.4740***	17.9800
	(0.0266)		(0.0264)	
Lo_TAs	0.0225	0.9500	0.0322	1.3700
	(0.0237)		(0.0235)	
INF	0.1412***	8.9700	0.1403***	8.9700
	(0.0157)		(0.0156)	
Spec_t	−0.0269*	−1.7800	−0.0261*	−1.8100
	(0.0151)		(0.0145)	
EX	−0.3072***	−7.8400	−0.3013***	−7.8200
	(0.0392)		(0.0385)	
RINT	0.0078***	5.1200	0.0072***	4.6000
	(0.0015)		(40.0016)	
Constant	−0.9610	−3.2500	−1.4815	−4.9300
	(0.2957)		(0.3004)	
Banks		584		584
Observations		4122		4122
Wald Chi 2(60)		1645		1835
Prob > chi2		0.0000		0.0000
R-sq		0.5525		0.5607

Source: Author's estimate (2017) using STATA 14
Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

DIV_Ratio^2 in the equation. The results are presented in Table 8.3 (Model 2). The study observes a negative and statistically significant relationship between the linear term *DIV_Ratio*, quadratic term *DIV_Ratio*^{2} and banks' profitability at 1 percent level. Unlike other related studies found in development markets, the present study documents that the link

between income diversification and banks' profitability is linear and not curvilinear. The negative relationship established in Model 2 suggests that DIV_Ratio^2 has a disparaging effect on banks' profitability. The result concludes that banks in Africa enjoy high levels of profits at lower levels of income diversification. Explicitly, over-diversification into non-interest-generating activities is not rewarding for banks in Africa.

In terms of other risk measures, the study considered includes impairment charges, equity to assets and cost income. Risk measure captured by *Impairm* is negatively related to banks' profitability at 1 percent. This suggests that banks with high provision for impairment charges affect banks' profitability. This result is consistent with Kosmidou (2008), Thakor (1987) and Miller and Noulas (1997). Equity to assets proxied by *Eq_TAs* represents the amount of assets on which shareholders have a residual claim exhibiting significant positive relationship at 1 percent with profitability. This implies that banks in Africa with equity to assets ratio positively affect banks' profitability. Consistent with the study's expected outcome, cost income proxied by *Coin* defined as company's costs in relation to its income confirms a negative relationship at 1 percent significant level with profit. This result suggests that the lower the ratio, the more profitable the banks in Africa. The result provides a good picture on how efficiently the banks are being run. Firm size is normally used as a proxy for competitive position and firms' advantage within an industry (Johnson et al. 1997). Bank size captured and measured in this study includes gross loans and loan to total assets as proxied by *GrL* and *Lo_TAs*. While an insignificant result is found for *Lo_TAs*, a negative impact is found for *GrL* at 1 percent significant level with profitability. Finally, the macroeconomic indicators which are considered not under the management control as represented by *INF*, *EX* and *RINT* are all significant in explaining banks' profitability at 1 percent significant level. While *INF* and *RINT* confirm a positive relation with banks' profitability at 1 percent significant level, *EX* exhibits a negative relation with profitability. The positive relationship between *INF* and profitability is consistent with related studies such as Haron and Azmi (2004) and Staikouras and Wood (2003), Bourke (1989) and Molyneux and Thornton (1992), Bourke (1989), Molyneux and Thornton (1992), Revell (1979) and Heggestad (1977), all confirmed that inflation impacts positively on

banks' profitability. The result is however not consistent with the result of Heggestad (1977) who indicates that no relationship exists between inflation and a banks' profitability.

Income Diversification, Ownership Controls and Global Financial Crisis (GFC)

In Table 8.4, further estimations are conducted to provide a detailed picture of how diversification affects banks' profitability under ownership structures. When the results are decomposed into government (state) and non-government ownership structures interesting findings are revealed. The results reveal that a negative relation exists between income diversification and banks' profitability under both government-controlled (state banks) and non-government-controlled banks. This result implies that when African banking industry is split into ownership controls (government and non-government), a negative relationship is still established between income diversification and banks' profitability at 1 percent significant level. The industry was decomposed further into periods before and after the global financial meltdown. The global financial meltdown began in 2007 in the subprime mortgage market in the United States and developed into a full-blown international banking crisis. The result of the crisis further led to the collapse of the investment bank Lehman Brothers on September 15, 2008.[1] The relevance for this variable consideration stems from the fact that the crisis had led to some changes in management practices and policies. The result as presented in Table 8.5 reveals similar findings suggesting that banks' profitability responds negatively to income diversification before and after global financial crisis (GFC) at 1 percent significant level. This result is an indicative of the fact that in stable, improved economic conditions and worst financial crisis, banks' profitability responds negatively to income diversification.

Table 8.4 Random effect estimation according to ownership structure

Variable	Government controls				Non-government controls			
	Coefficient	Robust standard error	Z-value	Prob (P > |z|)	Coefficient	Robust standard error	Z-value	Prob (P > |z|)
DIV_Ratio	−0.6808	0.0770	−8.8400	0.0000	−0.8765	0.1628	−5.3800	0.0000
Prtxpr	0.4318	0.0106	40.7500	0.0000	0.4503	0.0259	17.3900	0.0000
Impairm	−0.2093	0.0083	−25.1900	0.0000	−0.2771	0.0193	−14.3600	0.0000
GrL	−2.1400	0.1990	−10.7538	0.0000	−0.0672	0.0994	−0.0677	0.0000
Coin	−0.1688	0.0339	−4.9800	0.0000	−0.5118	0.0796	−6.4300	0.0000
Eq_TAs	0.4551	0.0238	19.0800	0.0000	0.5583	0.0535	10.4400	0.0000
Lo_TAs	−0.0229	0.0209	−1.0900	0.2740	0.1783	0.0516	3.4500	0.0010
INF	0.1394	0.0154	9.0300	0.0000	0.1043	0.0341	3.0600	0.0020
Spec_t	−0.0050	0.0149	−0.3400	0.7370	−0.0882	0.0304	−2.9000	0.0359
EX	−0.3428	0.0434	−7.8900	0.0000	0.1203	0.1311	0.9200	0.0000
RINT	0.0061	0.0014	4.4300	0.0000	0.0149	0.0037	3.9800	0.0004
Constant	−1.0586	0.2750	−3.8500	0.0000	−1.5515	0.8071	−1.9200	0.0550
Observations	2402				652			
Wald Chi 2(60)	3110				823			
Prob > chi2	0.0000				0.0000			
R – sq	0.5655				0.5625			

Source: Author's estimate (2017) using STATA 14

Table 8.5 Random effect estimation before and after global financial crisis (GFC)

Variable	Before global financial crisis (GFC)				After global financial crisis (GFC)			
	Coefficient	Robust standard error	Z-value	Prob (P > |z|)	Coefficient	Robust standard error	Z-value	Prob (P > |z|)
DIV_Ratio	−0.5375	0.1078	−4.9900	0.0000	−1.0453	0.1016	−10.2900	0.0000
Prtxpr	0.5165	0.0205	25.2500	0.0000	0.4145	0.0116	35.6700	0.0000
Impairm	−0.3144	0.0158	−19.9300	0.0000	−0.1843	0.0086	−21.5000	0.0000
GrL	−0.3560	0.6120	−0.5820	0.0000	0.2330	0.0204	11.4216	0.0000
Coin	−0.2324	0.0571	−4.0700	0.0000	−0.2358	0.0387	−6.0900	0.0000
Eq_TAs	0.6163	0.0456	13.5100	0.0000	0.4336	0.0244	17.7500	0.0000
Lo_TAs	−0.0641	0.0382	−1.6800	0.0940	0.0850	0.0225	3.7700	0.0000
INF	0.0785	0.0243	3.2300	0.0010	0.2004	0.0179	11.1800	0.0000
Spec_t	−0.0660	0.0273	−2.4200	0.0150	−0.0171	0.0150	−1.1400	0.2530
EX	−0.3565	0.1529	−2.3300	0.0200	−0.2940	0.0417	−7.0500	0.0000
RINT	0.0063	0.0021	2.9900	0.0030	0.0081	0.0018	4.5300	0.0000
Constant	0.8431	0.8170	−1.0300	0.3020	−1.1034	0.2899	−3.8100	0.0000
Observations	965				2089			
Wald Chi2(60)	1321				2607			
Prob > chi2	0.0000				0.0000			
R − sq	0.5813				0.5566			

Source: Author's estimate (2017) using STATA 14

Conclusions and Policy Implications

In the early 1990s, many developing economies in an attempt to attain economic resilience have witnessed the gradual but noticeable liberalization of its financial sector. These financial reforms in many African countries are believed to have shifted the attention to the generation of non-traditional income in the form of fees, transaction fees, annual and monthly account service charges, inactivity fees, check and deposit slip fees and so on. The present study uses a panel data of 584 banks and well-functioning internationally active banks with various specializations headquartered in 50 African countries spanning from 2001 to 2013. Random effect technique was employed to estimate the impact of income diversification and banks' profitability. The study further attempted to investigate if any the existence of a non-linear relationship between income diversification and banks' profitability. Results from the study suggest that a negative relationship is found between income diversification and banks' profitability. This implies that diversified banks in Africa are less profitable. This seems to suggest that banks in Africa enjoy high levels of profits at lower levels of income diversification. This result is consistent with Jones and Hill (1988). Jones and Hill (1988) contend that diversification beyond a certain degree raises internal governance and administration costs to the point that performance suffers. Further, although the study invalidates a non-linear relationship between income diversification and banks' profitability, the findings indicate that income diversification has a diminishing marginal impact on banks' profitability. Again, balance sheet (pretax profit, impairment charges, equity to assets cost income, etc.) and economic indicators (inflation, exchange rate and real interest rates) do have a significant effect on banks' profitability, however diverse the impact. When results are segregated into ownership controls (government and non-government banks), the results revealed that a negative relationship exists between income diversification and banks' profitability under different controls. This implies that when African banking industry is split into ownership controls, a negative relationship is established between income diversification and banks' profitability. Finally, the African banking industry was decomposed further into peri-

ods before and after the global financial meltdown and full-blown international banking crisis. The result reveals similar findings suggesting that banks' profitability responds negatively to income diversification regardless of different economic recessions. This result is an indicative of the fact that in stable, improved economic conditions and worst financial crisis, banks' profitability responds negatively to income diversification. Overall, conversely to Western economy studies which have confirmed a positive relationship between income diversification and banks' profitability, the present study validates and confirms a negative relationship between these variables for banks in Africa. The results from this study provide the following recommendations: SMEs' lending implication and managerial and policy implications.

Implications for SMEs' Lending

Although data availability did not allow the study to provide a direct assessment of the effect of SME financing regulation on banks' diversification behavior, it's relevance for SMEs' operations cannot be underestimated. The Organisation for Economic Co-operation and Development (OECD) reports that more than 95 percent of enterprises in the OECD area are SMEs. These enterprises, accounting for almost 60 percent of private sector employment, make a large contribution to innovation and support regional development and social cohesion.[2] Brian Robertson who retired as Group Managing Director and Chief Executive of HSBC Bank plc and later become Chairman of HSBC Latin America and a Director of HSBC North America Holdings said in 2001, "SMEs are the very lifeblood of Hong Kong commerce, which makes them worthy of special consideration and deserving of their own 'niche' in banking terms …" (Chan and Dow Jones Newswires 2001). Lending to small firms traditionally has been a business served primarily by the banking industry. Among studies which have confirmed the great importance of bank credit to SMEs in developed countries include Ulrich and Casel (1975), and Blackwell and Winters (2000). In the Philippines, micro, small and medium enterprises account for 99 percent of the total number of firms and contribute to 60 percent of the total employment in the country (Meslier et al. 2014). An inclusive financial system is therefore vital to

foster SME development, which boosts economic growth. Traditionally, banks accept deposit and create credits. Some governments have imposed a minimum amount of bank lending to SMEs. However, despite the mandated system of lending to SMEs, access to finance remains to be one of the key constraints in doing business in Africa (World Bank 2013). Results from the present study imply that diversified banks in Africa are less profitable. This result suggests that banks in Africa enjoy high levels of profits at lower levels of income diversification. Stated differently, a shift toward non-interest activities reduces banks' profits. Such a result seeks to provide some amount of relief to SMEs' sector perceived as risky sector. This is because commercial banks mostly overestimate the costs and underestimate the potential returns from this market segment (Young and Deborah 2005). As banks focus and stay within their core credit mandate, they are in a better position to allocate higher percentage of their loan portfolio to businesses including SMEs. This will increase sustainable access to external finance to SMEs. In the Philipines and other jurisdictions, studies have shown that a higher involvement in non-interest activities is only beneficial for banks with low exposures to SMEs (Meslier et al. 2014). In the sub regions for that Ghana, Boadi et al. (2017) employ the fixed effect model as the main regression tool to investigate the impact of SMEs financing on banks' profitability in Ghana. The result reveals that SMEs contribute significantly to banks' profitability in Ghana.

Managerial Implications

Recent economic conditions have drawn many commercial banks to seek out less risky and more liquid assets, such as the government's securities and a shift in revenue generation from interest income from loans and advances as compared to the revenue from non-traditional activities. The renewed debate among politicians, economists and researchers is that during unstable economic environment, banks do nothing but use treasury bills as a safe haven. For instance, in Ghana at a recent Facts-Behind-the-Figures series organized by the Ghana Stock Exchange, Owiredu (2015) noted "the challenging economy had made it riskier to lend to individuals and businesses, hence the refuge in government instruments such as the

Treasury Bill…so if government is borrowing at a handsome rate which is more secured, we will invest in such government papers." On the same platform, Adu (2015) added "The thing is, we will do less loans and buy more T-Bills. If the rate is 25 per cent and 26 per cent, what is the motivation to do more loans, which is riskier?" Several countries have passed some acts imposing restrictions on the quantum of money in respect of credit allowable to the government. Despite these imposed restrictions, banks specifically have not only been active and significant participants but also play a major role in the government securities business. The change in the banks' business strategy is largely influenced by nonperforming loans (NPL). The present study which suggests that more diversified banks in Africa are less profitable should help to change banks' business strategies. This stands to reason that management of banks should focus more on their core intermediary role. This result is an indicative of the fact that banks which have failed in providing credit to businesses as a result of recent economic conditions would go back on their decisions.

Policy Implications

The financial sector is one of the essential institutions in every economy. Schumpeter (1934), Gerschenkron (1964) and others have argued that as the financial sector develops, it trickles down to other sectors of the economy because the sector presents the most effective linkages with the other sources of the economy. These findings from the study provide useful insights for regulatory authorities in Africa. Studies have shown that access to finance remains to be one of the key constraints in doing business in Africa. Mandated credit programs and policies that help banks allocate a higher percentage of their loan portfolio to business should be pursued. As such regulations encouraging banks to lend to priority sectors, including SMEs, should be implemented in African countries. It is therefore recommended that central banks in Africa should strengthen the financial sector by pursuing anti-inflationary or economic stabilization policies since an unstable macroeconomy distorts business policies and decisions and further dips banks' profits.

Limitations and Future Research

Decomposing the non-interest income into various segments and testing for long-run effect are considered as limitations for this study. It is therefore recommended that a study into the long-run relationship of the income diversification-banks' profitability nexus deserves attention in future research.

Appendix 1: Variance Inflation Factor (VIF) for the Explanatory Variables

Variable	VIF	1/VIF
DIV_Ratio	1.36	0.73705
Prtxpr	2.33	0.42919
Impairm	1.73	0.57804
GrL	1.43	0.69723
Coin	1.22	0.82151
Eq_TAs	1.14	0.87783
Lo_TAs	1.09	0.9202
INF	1.06	0.94586
Spec_t	1.05	0.95459
EX	1.03	0.97015
RINT	1.02	0.97611
Mean VIF	1.31	

Note: The mean VIF was 1.31, which is much lower than the threshold of 10. The VIF for individual variables was also below 10. This indicates that the explanatory variables included in the model were not substantially correlated with each other, indicating an absence of multicollinearity between the variables

Appendix 2: Fisher Unit Root Test of Variables Based on Augmented Dickey-Fuller Test (ADF)

Variables	Inverse chi sq.		Inverse normal		Inverse logit		Modified inv. chi sq.	
	Statistic	Prob	Statistic	Prob	Statistic	Prob	Statistic	Prob
ROA	3357.9526	0.0000	−32.7407	0.0000	−45.0581	0.0000	65.1358	0.0000
DIV_Ratio	4419.1853	0.0000	−38.9748	0.0000	−57.6823	0.0000	87.7836	0.0000
Prtxpr	2519.3053	0.0000	−24.8063	0.0000	−31.9186	0.0000	43.5054	0.0000
Impairm	2923.6621	0.0000	−28.8038	0.0000	−37.1205	0.0000	51.9462	0.0000
GrL	2816.4375	0.0000	−25.6317	0.0000	−34.0667	0.0000	48.6475	0.0000
Coin	3849.0864	0.0000	−38.389	0.0000	−50.6791	0.0000	73.8247	0.0000
Eq_TAs	3568.5977	0.0000	−36.736	0.0000	−46.6997	0.0000	67.2162	0.0000
Lo_TAs	4484.1608	0.0000	−42.9688	0.0000	−59.4364	0.0000	89.3746	0.0000
INF	3984.4261	0.0000	−37.8152	0.0000	−52.1047	0.0000	77.1385	0.0000
Spec_t	2870.6609	0.0000	−35.7258	0.0000	−45.7547	0.0000	49.8679	0.0000
EX	4487.5738	0.0000	−33.0863	0.0000	−55.6801	0.0000	89.4581	0.0000
RINT	3931.6951	0.0000	−35.6641	0.0000	−49.2331	0.0000	75.8474	0.0000

Source: Author's estimate (2017) using STATA 14
Ho All panels contain unit roots, Ha At least one panel is stationary

Appendix 3: Hausman Specification Tests Between FE and RE Estimates

Variables	(b) fixed	(B) random	(b−B) difference	sqrt(diag(V_b−V_B)) S.E.
DIV_Ratio	−0.7874	−0.7680	−0.0194	0.0264
Prtxpr	0.4421	0.4381	0.0040	0.0045
Impairm	−0.2312	−0.2293	−0.0019	0.0035
GrL	−0.0228	−0.023	0.0159	0.0954
Coin	−0.2482	−0.2316	−0.0166	0.0140
Eq_TAs	0.5122	0.4986	0.0136	0.0108
Lo_TAs	0.0289	0.0225	0.0065	0.0085
INF	0.1310	0.1412	−0.0102	0.0064
Spec_t	−0.0286	−0.0269	−0.0017	0.0061
EX	−0.3100	−0.3072	−0.0028	0.0193
RINT	0.0067	0.0078	−0.0010	0.0005

Source: Author's estimate (2017) using STATA 14

Note: Thus, the Hausman specification test is carried out to inform whether RE estimation gives more consistent results, given the data used for this study. When Prob > X^2 = α, the null hypothesis is rejected. This reinforces the consistency of the RE in estimating the chosen model

Notes

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2. OECD SME and Entrepreneurship Outlook 2005 Edition.

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