Credit Risk Management and Profitability: Challenges and Insight of Commercial Banks

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*Abstract:-*The present article aimed to determine the impact of credit risk management on bank profitability performance using the Ecobank group covering the period 2013 to 2017. Based on research conducted abroad on bank and profitability indicators, in order to obtain research results the author evaluated return on assets (ROA) and return on equity (ROE) indicators of the Ecobank Group. This research interrogated the macro and micro implications of credit risk management on the profitability performance on the Ecobank Group by applying key credit risks tools and techniques. Based on the obtained results, the author have concluded that there is a statistical significance in profitability and default rate (i.e. a borrower's default negatively affect banks profitability-ROA &ROE); a finding in line as posited in earlier studies by Opoku (2016); Gizaw et al (2015) & Mendoza et al (2017).Based on the study outcome, the author concluded that commercial banks must adhered to facility granting protocols to avoid giving bad loans as its impact on investor returns is detrimental and could affect their share prices in medium to long term.

Keywords: Profitability, ROA, ROE, commercial banks, Ecobank group.

I. INTRODUCTION

Credit management and its associated risk form the main drivers of the business of banking, and since about 70 percent of a banks revenue emanate from interest income, there is the need for efficient management of the risk associated to this credit as they affects the profitability performance of banks (Li & Zou 2014)

After the 2007 and 2008 financial and banking crises led to global recession, new risk management techniques emerged (for example the enactment of the Basel III accord which aims to strengthen among other things the credit risk management policy techniques) of commercial banks worldwide. See Basel III accord, released, 2010)

A bank's ability to properly apply these credit risk management tools (including the Basel III accords and other internally developed credit risk management policies) will help reduce defaults and its associated impact thereby providing the bank with opportunity to improve profitability performance, growth and competitive advantage.

Credit risk management has been issue from both lenders and borrowers points of view. Credit risk basically has to do with the possibility of the borrower not adhering to repayment schedule, Swartz (2013). In terms of loan delinquency who is to be blame? Is it that the banks are not doing rigorous due diligence on potential borrowers to ascertain credit worthiness? On the other hand, are the borrowers not able to pay due to high interest and auxiliary cost charges on the loan or is an intentional decision by borrowers not to honor their obligation when they fall due. This has motivated the study; hence exploring credit risk management tools application and how its efficient utilization impacts on the profitability performance of the Ecobank Group's operations; expecting to come out with better insight of the situations and its accompanied challenges.

II. LITERATURE

Banks play vital role in the economies of developing countries, which has limited access to efficient capital markets. The economic growth of such countries is dependent on well-functioning banking system. Barth et al (2004). Though banks are faced with numerous risks including market, operational and credit of which all contribute against better bank performance, researchers have well documented higher negative impact of credit risk on performance. (Afolabi, 2018; Opoku, 2016; Mendoza et al, 2017).

2.1 Challenges of managing credit risks

According to SAS (2016) the global financial crisis of 2007/2008 and its associated credit crunch put credit risk management into global regulatory spotlight. As an end product, regulators is demanding more transparency in the field of customers' knowledge and their associated credit default.

2.1.1 The evolving regulatory landscape is leading to higher cost

The ongoing regulatory reforms and new frameworks like Basel III &IV whichaims, to enhance the stability of the financial system comes with a higher associated cost and uncertainties to banks more especially the global systemically important banks (G-SIBs). Basel accord (2010; BCBS 239). The increase in the amount and loss-absorbency of capital will strengthen the banking sector; but its associated additional costs, new assets and funding liquidity requirements will generate even low return thereby reducing profitability performance even further of these banks already struggling to stay profitable. (Thun, 2016; Rieker, 2013; Moody's, 2015; &Cour-Thimann et al, 2013)

The banking system is however responding with drastic measures aimed at absorbing the adverse impact on their balance sheet (for example pulling out of commodities and structured products) considered costly and focusing on home markets and lien strategic global markets. (Thun, 2016 & Hahn, 2014). This approach is win-win in the short term, however, will be a win-loss in the end because global competition requires global dominance to be advantageous.

2.1.2 Problem of data, its management and reporting.

Banks inability to access the right data at the right time, causes systemic delays SAS (2016). Information availability in developing countries is almost non-existent, and even if there is, its access is more problematic. Brownbridge (1998). According to Liuksila (1996), poor loan quality starts from the data collection and processing mechanism. Liuksila's work was later confirmed by Gabi (2003) which posit that the information challenges have contributed to huge accumulation of non-performing loans in banks.Manual spreadsheets-based reporting processes overburden analysts and IT causing unnecessary delays and errors. See Ernst & Young (2014) and Santander el al (2015).

There is the need for a continues effort of banks to look for financial technology strategies that focus on creating and fostering a culture within the organization that helps to develop new ideas and services. Collaborating with newly emerging competitors and revamping their digital infrastructure and modernize their branch networks to leverage on changes in client needs and behavior through linear analysis of previous experiences and extrapolating future trends and servicing future needs. Thun (2016; Duranton et al (2014), Dapp (2014) and Ernst & Young (2014).

2.1.3 No group wide risk modelling framework and its constant re-work

According to SAS (2016) without a groupwide risk models, banks' ability to generate well-coordinated complex meaningful risks measures is limited if non-existent; what worsens the Pollux situation is the consistent change of the model's parameterby experts which is negatively affecting the banks' efficiency ratio through duplication of efforts. Kalapo et al (2012) & Kithinni (2010).

Adoption of newer technologies and leaner processes to improve operational efficiency and reduced operational costs, which will aid faster decision and flexibility to new developments in the market, is of uttermost importance in new development of transparency and information asymmetry by the industry. Santander & Wyman (2015).

2.1.4 Insufficient risk tools

SAS (2016) posits without robust risk solutions, banks will not be able to identify and re-grade portfolios for effective risk management. Mendoza et al (2017) posit that where there are insufficient risks tooling it results to high non-performing loans, which effectually affects profitability performance.

Afolabi (2018) cited that indigenous banks in Ghana and Ahmad & Ariff (2007) also cited banks in Thailand, Indonesia, and Japanetc. experienced high non-performing loans and significant credit risks resulting in bankruptcies. These they attributed to the banks' inability to develop sufficient risk tools to support their customer assessment and loan facility processing.

2.2 Credit RisksInsight

An increasing global interest of the finance and business communities to see application tools related to the prediction of credit risk and bankruptcy and/profitability has been observed lately. Garcia et al (2015). A culture of credit risk must be central if banks' aims to achieve improved profitability performance and avoid the recurrence of the 2007/08 financial crisis. Peze (2016).

2.2.1 Global Reforms

Global reforms undertaken to date have brought sanity in the financial system. However, the extent of its robustness to mitigate future financial disasters remains questionable. For instance, extensive work on capital and liquidity, resolutions and derivatives needs to be done to ensure completeness of these reforms.

By late 2010, Basel promulgated its Basel III capital standards, significantly revising previous Basel accords. Basel III has set higher-quality capital for trading positions, securitization and counter party credit exposure and secured lending transactions than the I & II. For example, the III has set tier 1 capital at six percent[+] of its risk-weighted asset; with tier 1 common equity at 4.5percent of its risk-weighted asset; a tier 1 capital leverage at 3 percent of the total exposure of banks. Others includes tier 1 levels at 2.5 percentage point of the minimum 4.5 percent common equity to enable higher buffer of capital for leverage. Again, some minimum capital ratios are also set higher than II&I with a creation of a capital conservation buffer of rue minimum. (Barr, 2015a; Coates, 2015 and Barr & Vickers,2013)

In affirmation to the Basel committee's commitment to globally avoid future financial crisis, a Basel IV being even improvement to the III is already being implemented gradually, with full implementation anticipated by January 2019.

In response to the global interventions, blocks, zones and countries for example the USA and the UK have embraced the need for ring fencing and stronger horizontal buffers between retail deposit banks and other riskier financial functions. Barr & Vickers (2013). In 2014 Europe officially adopted its single resolution mechanism to be administered and monitored by the European central bank as part of its supervisory role. Barr (2014; 1014-15). Specific examples include:

European Union: The eurosystem according to article 18.1 of the statue of the ESCB requires all credit operations by the

ECV and the national central banks (NCBS) be based on adequate collateral, which meets high credit standards. These standards are elaborated framework of credit assessment (the European credit assessment framework-ECAF). The framework uses multi system approaches such as external credit assessment institutions, counterparties' internal rating based (IRB) system, third party providers' rating tools (RTS) and the national central banks' in-house credit assessment systems (ICASs). Their performance is closely monitored on annual basis to observe default rate and compared to the credit quality threshold set by the Euro system. Jose Manuel Gonzalez-Paramo (2010).

USA: The passage of Dodd-Frank wall street reforms and consumer protection Act of 2010 which ushered in a comprehensive reform in key areas, whilst enlarging regulatory parameters in areas of beefing up bank supervision, setting higher capital and liquidity requirements, rigorous stress tests and resolutions planning. Aimed at forcing firms to internalize more of their cost they impose on the system. The Dodd-Frank reforms also set up a bigger financial buffer to absorb losses and to resolve sudden disorderly failure that puts the economy at risk.

Africa: Africa's bank reforms date back mid 1980's where financial deregulation aimed at enhancing competition, sustainability, profitability and growth of the banking industry was enacted. Deregulation saw sudden growth in the financial sector, however sustainability and profitability has not been as anticipated, for example most indigenous African banks have either folded up, been taken over by global banks or operating at losses. (Afolabi, 2018: Adusei, 2013 & Mensah, 2015).Most African central banks have also introduced new capital requirements coupled with much stiffer regulatory framework all aimed at conforming to the global standards and also to ensure bigger buffers to withstand sudden falls in the financial system. Chief among them includes Ghana with minimum capital requirement raised to GH$400 million (BOG, 2017); Nigeria with minimum capital requirement raised to N10 billion (CBN, 2017); South Africa with minimum capital requirement raised to R250million (SARB, 2017); andRwanda with a minimum capital requirement raised to rwf5billion (BNR, 2015). Other reforms include the enactment of the African trade block AU (2018) to open up the African market of trade in general and financial trade to allow for transparency in the financial system. The Anglophone West Africa in the process of introducing the ECO currency to absorb the shocks of their currency fluctuations and to strengthen their banking systems was reechoed by the Ghanaian finance minister Hon. Ken Ofori Atta (03, 2018).

2.2.2 Credit risk Models

"There is no miracle solutions but a banks' strategy, business models, practices and its tolerance to risks must be consistent" Pezè (2016).Credit risk tools are applicable in individual loans or loan category, which can be measured by the dependence

of variables and return. (Thun, 2016; Johnson, 2017, Liu & Tan, 2009&Breger et al, 2003). Quantitatively credit risk can be model using among other methods:

a) *VaR as tool for loan portfolio optimization:* Value at risk (VaR) measures portfolio risk.by using profitability occurrence to estimating the loss given default and impact. A higher risk signifies a higher loss at a given probability. It uses percentiles (99th chance) to access value of investment at risk. VaR and standard deviation works on same information asymmetry. (Zech, 2003 &Hull, 2007)

b) *Market implied models:* The main objective is to obtain credit ratings from market information. If market participants correctly anticipate changes in the fundamental, one would expect simultaneous response to the implied credit ratings profile of issuers even before credit rating agencies' input. Developed by LudovicBreger, Lisa Goldberg, and Oren Cheyette (2003). The model classifies each issuer within different limit to help define the implied credit ratings. Expressed as

$$P_{(b)} = \sum_j \left[N_j \left(s_j - \beta_{i(f)}^+ + N_i (\beta_{(j)}^- - S_j) \right)^+ \right]$$

Where $i_{(j)}$ denotes credit rating from issuer; $S_{(j)}$ spread of issuer; β_I^- implied inferior limit from credit rating; β_i^+ implied superior limit from credit rating; N_j number of issuersandN_i number of issuers with credit ratings.

c) *Default Probability Models:* It attempts to estimate the probability default of issues. Developed by Vrugt (2011) with a goal to calculate the issuers' risk-neutral default probability and its recovery. The tool calculates the default probability with a given recovery rate, or it can simultaneously calculate both (recovery rate and default probability) from bond prices.

$$P_o = \sum_{n=1}^{n} df_n [(CF_n \times S_n) + (RV \times S_{n-1} \times \pi_n)]$$

Where CF_n cash flow (coupon/principal) in period; df_n discount factor; π_n default probability; S_n cumulative probability, RV recovery rate

d) *Financial ratios model:* Financial ratios are used to show fundamental picture of the credit risks of the issuer that is not affected by market volatility. Using six sets of financial ratios develop for each relevant sector (government, agencies, supranational, local authorities, corporate and banks). Liu and Tan (2009) point out that this is also a key factor to explain the difference in the ratings of various agencies.

2.4 Bank Profitability

Profitability is the earnings potential of an entity. As an element of a bank's value creation and wealth maximization of

shareholders' is based, the importance of profitability cannot be ignored. Studies have used return on assets calculated as EBIT to total assets of a bank as a primary measure. See (Abbas et al, 2014; Aremu et al, 2013; Adusei, 2015; Biker, 2017; Danuletiu & Roman, 2013; Erina & Lace, 2014; Gizaw et al, 2015; Mendoza et al, 2017; Obamuyi, 2013; Menicucci, 2016; and Petria, 2015). In furtherance, return on equity calculated as net income per total equity has also been used by researchers. According to (Abbas et al, 2014; Aremu et al, 2013; Erina& Lace, 2013; Danuletiu & Roman, 2013; Biker, 2017; Gizaw et al, 2015). According to Johnson C (2017); and Aremu et al (2013)' profitability of banks can also be measured using net interest margin.

2.5 Relationship of variables

Many studies significantly showed impact of credit risk on banks profitability performance. Mendoza et al (2017) concluded that a credit risk has a significantly negative impact on ROA based on the study of six banks in Nigeria, Iloska (2014) posit loan loss as a main provision driver of profitability and exhibited a negative relationship with ROA after using 17 banks in Macedonia. Gizaw et al (2015) study eight commercial banks over 12-year period in Ethiopia and find out that non-performing loans, loan loss provision and capital adequacy negatively impact on banks profitability (ROA & ROE). The finding of Opoku (2016) is consistent with earlier studies, his study on credit risk impact and profitability of selected Ghanaian banks saw a negative relationship between ROA and ROE and non-performing loans. Again, Erina and Lace (2013), after using linear regression model in studying 31 commercial banks in Lativia; Aremu et al (2013) posit a negative relationship both in the short term and long term between credit risk and profitability of banks after an error correction and co-integration mechanism (ECM) was used in the First bank of Nigeria. Lastly, Abbas et al (2014) after using linear regression model on 21 banks in Pakistan arrived at a conclusion that credit risk negatively affects banks ROA and ROE.

III. METHODOLOGY AND MODEL

Financial ratios model in which a panel regression analysis where profitability performance (ROA and ROE) being the dependent variables to the independent variables of capital adequacy ratio (CAR); cost to loan asset (CLA); default rate (DR); non-performing loans per gross loans ratio; and credit interest per credit facility ratio was adopted.

Secondary data from annual reports covering 2013 to 2017 from the Ecobank Group were used. The Ecobank Group was purposively sampled due to three key areas of the group's importance to the African continent namely: *Continental Dominance:* The Ecobank Group being an indigenous African bank headquartered in Togo has over 1233 branches in 33 countries across Africa and is considered widest in coverage in sub-sharan Africa; *Brand:* The Ecobank group as a brand is reverence worldwide as among the top global

performing commercial banks winning many awards including (but not limited to) being adjudged the best bank CSR four times in Africa by the Euromoney Excellence Awards, seven time winning the prestigious bank of the year award in Ghana, the Telecom finance for the year awarded by the World Telecoms Awards, EMEA Finance award as the best structured finance deal in Africa and Africa investor of the year.And its *Employment creation*: Employing directly over 12,658 people (using Professor Bromley's multiplier effect study, (see Bromley 2003) over 65,290 families are being supported). Again The Ecobank Group have been providing funding and funding support services to SMEs in Africa which averagely employs about 70% of the African population (as in the case of Ghana SMEs employ about 75% of the employable populates, see Marfo 2015). The bank has been providing funding to corporations and governments to fund infrastructural development across the continent. The Ecobank Groupisseen as a key partner to Africangovernments in helping reduce the continent's challenges through employment creation, corporate social responsibilities, infrastructural and SMEs finance. The researcher using Ecobank Group as a case will also serve as bate for other African and or global commercial banks to emulateEcobank's step and improve their profitability performance.

3.1 Model Specification

The below enumerated models represent the impact of credit risk management on profitability performance.

$$RoA_i = \alpha_0 + \alpha_1 CAR_i + \alpha_2 CLA + \alpha_3 DR_i + \alpha_4 NPL_i + \alpha_5 CI_i + \mu_i$$

$$RoE_i = \beta_0 + \beta_1 CAR_i + \beta_2 CLA + \beta_3 DR_i + \beta_4 NPL_i + \beta_5 CI_i + \varepsilon_i$$

Where RoA represents return on asset, RoE represents return on equity, CAR is capital adequacy ratio, CLA is cost per loan, DR is default rate, NPL is non-performing loans per total loans, CI is credit interest per credit facilities, and μ and ε represent the error terms in the two equations.αandβ are the parameters/coefficients of the independent variables.

3.2 Definition of Variables

Table 1: The independent variables represent the credit risk management indicators as below

Variable	Definition	Formulae
Capital Adequacy Ratio(CAR)	Measures amount of capital as a percentage of its weighted credit risk exposure	Capital fund/weighted risk asset
Cost Per Loan (CLA)	Average cost per loan advanced to customers in money value	Total operating cost/total amount of loans
Default Rate (DR)	Changes to loan terms for customers who missed payment schedule(s)	Non-performing loans/total loans
Credit Interest per credit facilities	Measures the percentage of credit interests that have been paid in relation to total loans granted	Credit interest/credit facilities

Table 2: The dependent variable represents the profitability measured as below

Variable	Definition	Formulae
Return on Assets (ROA)	Measures company's earnings before interest and taxes (EBIT) in relations to its net assets	EBIT/Total Assets
Return on Equity (ROE)	Measures the firm's ability to generate income using its equity	Net Income/total equity

3.3 Data Analysis

The research design employed quantitative and ratio analysis approaches involving information collection regarding recent happenings to the Ecobank Group's profitability performance for the period 2013 to 2017. Use of credit risk indicators and profitability ratios, regression analysis, correlation analysis, descriptive analysis being a product of the panel square method applied on the data relating to the period under review, based on information as released by the Ecobank

Group and previous studies regarding commercial banks across the globe. This research interrogated the macro and micro implications of credit risk management on the profitability performance on the Ecobank Group by applying key credit risks tools and techniques.

3.4 Statistical analysis and interpretation

Descriptive statistical variables are summarized and presented in Table 2, which shows the mean value for each variable, as well as minimum and maximum values, and standard deviation. As shown by the data, average earnings of equity (ROE) in Ecobank group during the period from 2013 till 2017 was 11.3%, while return on assets (ROA) is 2.3%, indicating that the Ecobank Group have a higher return on Equity more than its average Asset returns. While the average capital adequacy ratio is 21.59%, corresponding to the bank's requirements of 10.93%, the average credit 11.12%, and a default rate 8.97%.

Table 2: Indicators of Banks according to Descriptive Statistics

	Obs.	Mean	Min.	Max.	Std. Deviation
Return on Asset (ROA)	10	.0231793	.007	.035837	.0102385
Return on Equity (ROE)	10	.1136	.042	.171	.048086
Capital Adequacy Ratio (CAR)	10	.2159	.163	.288	.0364614
Cost Per Loan (CLA)	10	.1092556	.0839544	.125365	.0131646
Default Rate (DR)	10	.0896644	.0454789	.1411766	.0339153
Credit Interest per credit facilities	10	.1117954	.0679058	.1695079	.0357461

Source: Authors' calculations

3.4.1 Return on average Equity (ROE)

A T-Value of -2.4 and a P-Value of 6% of the Default rate (DR) is statistically significant, indicating a correlation between the default rate and return on equity of Ecobank Group. The above finding is in consonance withGizaw et al (2015) study of eight commercial banks over 12-year period

in Ethiopia and find out that non-performing loans (default rate) negatively impact on banks profitability (ROE). Ecobank should therefore adhered to facility granting protocols to avoid giving bad loans as its impact on investor returns is detrimental and could affect its share prices in medium to long term.

Table 3: Linear Regression Analysis: Return on Avg. Equity (ROE)

	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
CAR	.9648118	.4816	2.00	0.102	-.2731804	2.202804
CLA	**-**1.35155	1.193314	-1.13	0.309	-4.419063	1.715962
DR	-1.090864	.4547671	-2.40	0.062	-2.25988	.0781516
Credit Int.	-.5774991	.4993799	-1.16	0.300	-1.861196	.7061977
_cons	**.215335**	**.1408884**	**1.5**	**.0187**	**-.1468303**	**.5775003**

Number of Obs.	10
F (4, 5)	2.24
Prob. > F	0.1995
R-squared	0.6422
Adj. R-squared	.3560
Root MSE	.03859

Source: Authors' calculations

3.4.2 Return on Asset (ROA)

A T-Value of -2.9 and a P-Value of 9% of the Default rate (DR) is statistically significant, indicating a correlation between a default rate and return on asset of Ecobank Group, a finding consistent with Mendoza et al (2017). If the ratio of default increases, e.g., Banks uses less deposit to grant loans or grant more loans without increasing the deposits, and then the bank performance deteriorates. Again, CAR of 1.3 and a P-Value of 5% is also statistically significant. The results is in consonance with the findings of Opoku (2016) and Johnson (2017).

Table 4: Return on Asset (ROA) – The Linear Regression Analysis

	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
CAR	.0464585	.0671353	0.69	0.520	-.126118	.2190352
CLA	.4556094	.1663486	2.74	0.041	.027997	.883222
DR	-.132575	.0633947	-2.09	0.091	-.295536	.0303864
Credit Int.	.0732144	.0696138	1.05	0.341	-.105734	.2521623
_cons	-.032927	.0196399	-1.68	0.154	-.083413	.0175593

Number of Obs.	10
F (4, 5)	6.90
Prob. > F	0.0287
R-squared	0.8467
Adj. R-squared	.7240
Root MSE	.00538

Source: Authors' calculation

IV. CONCLUSION

Proper credit risk management is an important indicator for profitability of banks in the changing financial environment. With current research, author was able to find interconnection between bank profitability and defaultsin the Ecobank group in the period from 2013 to 2017.

On the basis of the obtained results, the author conclude that default has had a negative effect on the capital and credit risks, as measured according to ROA, while according to ROE, negative – credit risk.

Considering the changes and complexities in customer behavior, the banks should be able to anticipate potential default in order to avoid negative consequences for the bankspecific indicators. This issue is topical not only for researchers but also for the bankers themselves, including bank management and shareholders. In future research the author intends to perform comparison of profitability of the banks in the entire African Union to find the links that exist between the Ecobank and foreign financial systems.

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