

Prudential Regulations and Profitability of Commercial Banks Listed At the Nairobi Securities Exchange, Kenya

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Abstract: *The study examined the effect of prudential regulations on profitability of commercial banks listed at the Nairobi Securities Exchange, Kenya. The study focused on the period 2013 to 2017 where research data was extracted from the financial statements of listed commercial banks in Kenya. Using panel regression analysis, the findings of the study reveal that prudential regulations are important in determining the profitability of commercial banks. Capital adequacy regulation was found to have a significant positive effect on profitability of commercial banks listed at the Nairobi Securities Exchange, Kenya. Liquidity regulation was found to have an insignificant negative effect of profitability of commercial banks listed on the Nairobi Securities Exchange, Kenya. Furthermore, the study found that credit risk regulation has a significant negative effect on profitability of commercial banks listed at the Nairobi Securities Exchange, Kenya. To ensure sustained return on banks' assets, the study recommends that bank managers should put in place effective credit risk management policies and embark on efficient risk minimization practices. In addition, the Central Bank of Kenya should be encouraged to implement measures that would ensure capital adequacy for all financial institutions that would want to operate in the country.*

Keywords: *Prudential Regulations, Profitability, Commercial Banks, Nairobi Securities Exchange.*

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I. Introduction

Globally, commercial banks play a major role in the economic growth of countries through the financial intermediation of channeling funds from surplus spending units to deficit spending units for various investment purposes (Akims & Jagongo, 2018). Commercial banks are the most integral component of the financial sector which is due to their ability to provide a wide range of services. They offer variety of financial services for depositors (lenders) and borrowers. These services include liquidity creation and safekeeping of savings, thereby allowing depositors to have a smooth consumption year in year out. Additionally, commercial banks carry out credit analysis, loans disbursement and monitoring of outstanding credits for customers (borrowers) requiring additional financing than that which can be raised from their internal sources or other alternative sources such as financial markets (Sheefeni, 2015a). How well they carry out this intermediary role influences their profitability and may in turn spur the economic growth of the country which they operate. The profitability of banks has therefore been suggested to have a direct relationship with the growth and development of an economy (Ngure, 2014).

Commercial banks in Sub-Saharan Africa (SSA) have been characterized by high profitability for the past two decades. The banks being more profitable than their counterparts in the other parts of the globe with a 2 percent average return on assets (ROA) (Flamini, McDonald & Schumacher, 2009). The high profitability in this region was attributed to their investment in highly risky ventures. Another reason for the high profits in this region is the huge gap that exists between the demand and supply of financial services. Thus, implying that SSA is characterized by few banks in comparison with the demand for banking services; consequently, there is less competition and high interest rates are being charged by banks. This situation is evident in East Africa which comprises of few government owned and controlled banks which have high market power (Ngure, 2014).

The banking sector in Kenya has been identified as one of the key economic pillars for the realization of Kenya Vision 2030 (Oketch, Cheruiyot, Namusonge & Sakwa, 2018). The sector has over the decade experienced various regulatory and financial reforms. The reforms have led to various structural changes in the banking industry and these have encouraged the entry of foreign banks into the country (Wachira, 2013). The financial sector of Kenya is to a large extent bank-based as the country's capital market is still not fully developed (Oketch *et al.*, 2018). Due to the dominance of commercial banks in the financial sector of Kenya, the country's financial intermediation process is largely dependent on commercial banks.

The financial intermediation role performed by banks is heavily reliant on their profitability. At the micro level, profitability is a necessity for the existence of banks. It is the major source of shareholders'

earnings, and also retained earnings are sourced from the profitability of banks (Ngure, 2014). At the macro level, a profitable banking sector cushions against negative shocks thereby making a sustainable financial system. High profitability in the banking sector enhances financial stability (Flamini *et al*, 2009). Conversely, low profitability of banks can bring about banking failure and financial crisis which have adverse effects on economic growth of a country (Ongore and Kusa, 2013). Therefore, just like every other business, banks are profit driven as they always strive to maximize profitability (Olweny and Shipho, 2011).

The key role of intermediation performed by banks makes it imperative that they operate in a safe manner to avoid failure and crises. One way to ensure this is for governments to provide diligent regulation of banks. All financial institutions are guided and regulated by various prudential guidelines which are designed and implemented so as to ensure a healthy and stable banking industry (Mohamed, Mutegi & Muriuki, 2017). Prudential guidelines are the sole responsibility of the apex regulator which is the Central Bank, therefore being responsible for the execution of these guidelines which are issued under the Banking Act unit 33(4) (Ndolo, 2017)

The rationale for the implementation of prudential guidelines is to ensure the continuous existence of banks which has a resultant effect of boosting economic growth and development of a country through the financing of investment activities (Barus, Muturi & Kibati, 2017). Therefore, negating these guidelines comes with severe damages to the banking industry, financial sector and the economy at large. These guidelines include but are not limited to capital adequacy regulation, liquidity regulation and credit risk regulation.

1.2 Statement of the Problem

Commercial banks play important roles in channeling funds from surplus to deficit unit in an economy (Olemu & Negasa, 2015). However, despite their important roles in the economy, banks are nevertheless susceptible to failure. Banking crises are generally linked to poor regulatory frameworks, thereby; making it necessary for sound regulations for these banks. This is because any failure of these banks has a potential multiplier effect on the entire economy.

The profitability of banks has been linked to prudential regulations, however, it is largely unclear if these regulations significantly contribute to bank profits. Therefore, the understanding of prudential regulations and the extent of their effect on profitability of commercial banks is important for bank management and other stakeholders such as the monetary authority and the government. This will in turn enhance the formulation and implementation of policies that will increase and sustain bank profitability.

Various studies have been carried out on prudential regulations and profitability of commercial banks which include Vianney (2013) for Rwanda, Sheefeni (2015b) for Namibia, Amina and Fedhila (2018) for Tunisia. However, the findings of such studies cannot be generalized for commercial banks in Kenya. This is attributed to the fact that different countries are characterized by varying economic conditions and financial systems, therefore banks are controlled and regulated by different guidelines (Olweny & Shipho, 2011; Ongore & Kusa, 2013). As such, factors affecting profitability of banks in one country may not necessarily be the same for other countries. The studies carried out in the context of Kenya include Kahuthu (2016), Mohammed *et al.* (2017), Ndolo (2017) and Osano and Gekara (2018). These studies are however characterized by various research gaps which span from conceptual to methodological gaps.

II. Literature Review

2.1 Theoretical Review

2.1.1 Agency Theory

Agency Theory was propounded by Jensen and Meckling (1976). The agency theory emanated from economic theory and has since dominated corporate governance literature. Daily, Dalton and Canella (2003) pointed out two key factors that led to the prominence of the theory. First is the simplicity of the theory in that it has reduced the corporation to two parties which are the shareholders and managers. Second is the generally accepted notion of the self-interest of human beings. Agency Relationships in the context of the firm provides the linkage existing between providers of corporate finances (principal) and that of those entrusted (agents) with the task of managing the affairs of the firm. In the context of banking, the management being the agent is expected to act in the best interests of the owners and increase profitability of banks.

In relevance to this study, Agency Theory posits that profitability is largely reliant on the nature and manner by which firm managers carry out their roles as assigned by their principals to maximize profits. The maximization of profits therefore, can be ascertained by the various profitability indicators such as return on assets and return on equity. The theory holds that the managers who are regarded as the agents may sometimes be involved in practices that are geared towards the satisfaction of their personal interests at the detriment of owners of the firm, in this case banks. The theory suggests that when this happens, the profitability of firms may

be easily depleted. Conversely, the profitability level of firms is increased when managers perform their roles effectively and efficiently.

2.1.2 Capital Buffer Theory

The Capital Buffer Theory was introduced by Calem and Rob (1996). The theory predicts that a bank that reaches the minimum regulatory capital ratio may have an incentive to raise more capital in order to minimize the risk of any regulatory costs triggered by the failure to meet the stipulated capital requirements. The theory is of the notion that banks strive to hold more capital than recommended. As such various regulations which aim at creating more capital buffers are formulated and implemented. The capital buffer is regarded as the excess capital which banks hold above the stipulated minimum capital required.

The Capital Buffer Theory postulates that banks having low capital buffers strive to acquire an appropriate capital buffer. Similarly, banks holding high capital buffers strive to keep their capital buffer. This is attributed to the notion that higher capital provides banks with more capacity to cushion against the effect of adverse shocks, thereby, reducing the likelihood of banking failure or collapse. Banks Capital buffer serves as a key determinant of capital adequacy and profitability of commercial banks. The prepositions of Capital Buffer Theory support the linkages between capital adequacy regulation and profitability of commercial banks.

2.1.3 Liquidity Preference Theory

Liquidity Preference Theory was propounded by Keynes (1936). Liquidity preference theory rests on the notion that short term securities are characterized by lower rate of return as investors in the market are trading off less liquidity as compared to when investing in medium or long-term securities. Banks deal with mostly liquid assets which include cash balance that can be demanded for by investors anytime. According to Keynes, demand for money is categorized in three motives; the first being the transaction motive which entails the desire to have cash in order to address basic recurring needs such as costs of transport and payments of raw materials. The second motive for the demand for money is for precautionary motive that is, unforeseen emergencies. Cash is held to cushion against any unexpected costs arising from emergencies such as illness or accidents. Lastly, speculative motive where cash is held in anticipation of future economic changes usually to venture into investment opportunities which include stock buying and other forms of investments.

Liquidity Preference Theory is key as it provides the inter link between liquidity regulation and profitability. In the context of banking, banks hold liquid assets for purposes of meeting short term obligations which include but not limited to demand for deposits by customers. In general liquidity is used for the day to day transactions of banks. The prepositions of liquidity Preference Theory support the variable liquidity regulation.

2.2 Empirical Review

Vianney (2013) studied the relationship between regulation and financial performance of commercial banks in Rwanda. The target population of the study was ten (10) commercial banks registered at the central bank of Rwanda. Research data was collected from eight (8) commercial banks the based in Kigali. The study found that both capital requirement and liquidity have a negative relationship with financial performance or return on assets commercial banks in Rwanda. This relationship between the two variables (liquidity and capital requirements) and financial performance were however, insignificant. The present study was however carried out for Kenya and not Rwanda.

Sheefeni (2015b) analyzed the bank-specific determinants affecting profitability of commercial banks in Namibia. The techniques of cointegration, unit root, forecast error variance decomposition and impulse response functions were utilized on quarterly time series data for the period 2001 - 2014. The findings of study indicated that credit risk, capital adequacy and liquidity risk are the key determinant of profitability of commercial banks in Namibia. The study suggests that the profitability of banks is determined by the quality of loan portfolio. The study by Sheefeni was based on aggregated data unlike this study which was based on micro level data.

Kahuthu (2016) analyzed the effect of prudential regulation on financial performance of Deposit Taking Savings and Credit Cooperative Societies in Kenya. The study was based on 124 licensed SACCOs in Kenya as at 31st December 2012. Data was analyzed using multiple regression analysis. The study reveal that capital adequacy (core capital to total assets ratio) and allowance for loan loss have a significant positive impact on financial performance of SACCOS as indicated by ROA. Liquidity has a significant negative impact on financial performance of SACCOS. However, the study was focused on SACCOS, therefore, due to the different contextual characteristics; such findings cannot be generalized for listed commercial banks. Additionally, in Kenya, SACCOs are regulated by Sacco Societies Regulatory Authority (SASRA) whereas commercial banks are regulated by the Central Bank of Kenya (CBK).

Mohamed *et al.* (2017) studied the effects of the Prudential Guidelines on bank performance in the context of Kenya. The study focused on the 43 commercial banks in Kenya. Using multiple regression analysis in a cross sectional framework, the findings of the study reveal that credit risk management and liquidity management have a significant positive effect on bank performance in Kenya. The current study unlike Mohamed *et al.* employed secondary data on a panel of the listed commercial banks in Kenya to analyze this relationship.

Ndolo (2017) researched on prudential regulations and performance of listed commercial banks in Kenya. Using panel regression analysis, the study focused on the eleven (11) commercial banks listed at the NSE, Kenya covering the period 2012-2016. In descriptive statistics mean and median were very close indicating that, data does not suffer from any outlier problem. Data was analyzed using descriptive and panel data regression analysis. The findings of the study indicated that, liquidity management regulation had insignificant positive relationship with the performance (ROE) of the listed commercial banks in Kenya while credit risk management regulation had an insignificant negative relationship. Capital adequacy regulations had significant negative relationship with banks performance for studied period. The present study however assessed profitability using return on assets which is considered as a key profitability measure utilized by regulators in assessing the efficiency of bank managers.

Osano and Gekara (2018) studied the effect of government regulations on profitability of commercial banks in Kenya. The research study was based on a census as it focused on all the 42 commercial banks in Kenya. Qualitative and quantitative techniques were employed for the analysis of data. The study was based on a regression analysis and the findings indicated that government regulations significantly predict the profitability of commercial banks. On the liquidity regulation ratio, the study concluded that there exists a significant and positive relationship between liquidity regulation ratio and profitability (ROE) of commercial banks in Kenya. Similarly, the research findings revealed a significant positive relationship between capital adequacy requirements and profitability of commercial banks in Kenya. A major flaw of this study is that the validity of the tests results seems not to have been verified therefore, casting doubts on its findings. To assuage this, appropriate diagnostics tests were carried for all the estimations done in the present study before the results were interpreted

Amina and Fedhila (2018) sought to examine the effect of prudential regulation on performance of banks in the Tunisian context. The study focused on all listed Tunisian commercial banks for the period 2001 to 2016. The findings from the study revealed that liquidity ratio has a significant positive effect on return on assets and an insignificant positive effect of return on equity. The study was however based on the Tunisian context where credit risk regulation and capital adequacy regulation were not considered. Furthermore, due to the varying regulatory systems and economic conditions of different countries such findings may not be applicable to the Kenyan context.

III. Methodology

3.1 Target Population

The target population of the study comprised of all the 11 commercial banks listed at the Nairobi Securities Exchange (NSE), Kenya. Therefore, the study was based on a census due to the few number of banks listed at the NSE, Kenya.

3.2 Empirical Model

The study was based on a panel regression analysis, in the empirical model, profitability was indicated by ROA and expressed as a function of prudential regulations.

$$ROA_{it} = f(CAP_{it}, LIQ_{it}, CRE_{it})$$

Where:

ROA = Return on Assets

CAP = Capital Adequacy Regulation

LIQ = Liquidity Regulation

CRE = Credit Risk Regulation

i = Bank (1,2,3....., 11)

t = Time period (2013 -2017)

3.3 Data, Data Sources and Measurements

The study was based on the period 2013 to 2017. The research variables were measured as follows: ROA: return on assets was measured using net income to total assets; CAP: Capital adequacy was measured using the ratio of core capital to total assets; LIQ: Liquidity was measured using liquidity ratio as indicated in the financial statements of commercial banks listed at the Nairobi Securities Exchange, Kenya; CRE: Credit risk was measured using the ratio of non performing loans to total loans. All research data were sourced from the audited financial statements of commercial banks listed at the Nairobi Securities Exchange, Kenya.

IV. Data Analysis and Results

4.1 Descriptive Analysis

The summary statistics on the variables employed in the estimations in the section are presented in Table 1

Table 1: Descriptive Analysis

Variable	No of Obs.	Mean	Std. Dev.	Min	Max
ROA	55	0.029	0.014	-0.010	0.062
Capital Adequacy Regulation	55	0.132	0.024	0.032	0.168
Liquidity Regulation	55	38.040	9.080	28.040	67.900
Credit Risk Regulation	55	0.081	0.077	0.013	0.450

Note: No. of Obs = number of observations; Std. Dev. = standard deviation; Min. = minimum; Max. = maximum.

Source: Authors' computations using Study data (2019)

Descriptive analysis was done to provide the basic features of the research variables. The statistics presented in Table 1 shows that the total observation for each variable is 55. With the exception of liquidity regulation, the mean and standard deviation of the variables indicate that the data is relatively stable over the years.

4.2 Results of Pre-Estimation and Diagnostics Tests

4.2.1 Stationarity Test Results

Panel data is tested for stationarity due to the time series component of it. To test for stationarity, Harriz-Tzavalis Unit Root Test was used.

Table 2: Harriz-Tzavalis Unit Root Test

Variable	Statistics	Z	P-value
ROA	-0.3968	-1.9586	0.0251
Capital Adequacy Regulation	-0.6076	-3.2277	0.0006
Liquidity Regulation	0.0234	-2.1597	0.0154
Credit Risk Regulation	-0.4939	-2.5431	0.0055

Source: Authors' computations using Study data (2019)

The null hypothesis was that all panels contain unit root. The p-value for all research variables as indicated in Table 2 were less than the threshold of 0.05. In line with this, the null hypothesis was rejected for all the research variables, thus, implying that the data is stationary.

4.2.2 Multicollinearity Test Results

Table 3 provides the results of the test for multicollinearity; this was done using the correlation matrix where the independent variables were check for multicollinearity.

Table 3: Correlation Matrix

	Capital Adequacy Regulation	Liquidity Regulation	Credit Risk Regulation
Capital Adequacy Regulation	1.0000		
Liquidity Regulation	0.0533	1.0000	
Credit Risk Regulation	-0.6099	-0.0525	1.0000

Source: Authors' computations using Study data (2019)

As presented in table 3, the explanatory variables used in the study were capital adequacy, liquidity and credit risk. The results of the multicollinearity test indicate that the coefficients of correlation for all the predictors vary within the range of -0.6099 and 0.0533. The values of the correlation coefficient are less than 0.8 which is the recommended threshold by Greene (2008). This therefore, implies that the research data is not affected by severe multicollinearity.

4.2.3 Results of the Test for Fixed or Random Effects

In panel regression analysis, there is the need to carry out the hausman test in order to select the best model for making inferences. The results of the test are shown in Table 4.

Table 4: Hausman Test

	Coefficients			sqrt(diag(V _b -V _B))
	(b) Fixed	(B) Random	(b-B) Difference	
Capital Adequacy Regulation	.0870775	.1445781	-.0575006	.0217765
Liquidity Regulation	-.0001137	-.0000775	-.0000361	.0000413
Credit Risk Regulation	-.0389055	-.0460408	.0071353	.0031597

b= consistent under Ho and Ha; obtained from xtreg
 B= inconsistent under Ha, efficient under Ho; obtained from xtreg
 Test: Ho: difference in coefficients not systematic
 chi2 (3) = (b-B)' [(V_b-V_B) ^ (-1)] (b-B) = 4.69
 Prob>chi2= 0.1959 (V_b-V_B is not positive definite)

The null hypothesis for the hausman test stated that the random effect model is preferred while the alternative hypothesis stated that the fixed effect model is preferred. A p value of less than 0.05 would imply a rejection of the null hypothesis and use of the fixed effect model, while a p value above 0.05 indicates the failure to reject the null hypothesis in which case a random effect model would be appropriate. The hausman test in Table 4 shows a p value of 0.1959 which is above the threshold of 0.05. In line with this, the null hypothesis was not rejected and the study relied on the random effect model.

4.3 Results from the Random Effects Model Estimation

Panel regression analysis was carried out by random effects to ascertain the effect of prudential regulations (capital adequacy regulation, liquidity regulation and credit risk regulation) on profitability of commercial Banks Listed at the Nairobi Securities Exchange, Kenya. The results are presented in Table 5.

Table 5: Panel Regression Analysis (Dependent Variable Profitability (ROA))

Variable	Coefficient	Standard Error	Z	P> z
Capital Adequacy Regulation	0.1445781	0.0600013	2.41	0.016*
Liquidity Regulation	-0.0000775	0.0001351	-0.57	0.566
Credit Risk Regulation	-0.0460408	0.0167158	-2.75	0.006*
Constant	0.01677	0.0101356	1.65	0.098
R-sq = 0.4962, Wald chi2(3) = 19.38, Prob> chi2 = 0.0002				
*significant at 5 percent				

The results in Table 5 indicate an R-sq of 0.4962 which implies that collectively the independent variables explain 49.62% of the variations in the profitability (ROA) of Listed Commercial Banks in Kenya. The findings of the study reveal that capital adequacy regulation has a significant positive effect on profitability of commercial banks listed at the NSE, Kenya. The significant positive effect of capital adequacy regulation can be attributed to the fact that the higher the capital of banks, the better their capacity to withstand shocks in the banking sector and carry out their roles effectively which results in higher profitability.

The finding that capital adequacy regulation has a positive effect on banks' profitability is consistent with the findings of Kahuthu (2016), Osano and Gekara (2018) who also found that capital adequacy has a significant positive effect on profitability of Deposit Taking Savings and Credit Cooperative Societies and commercial banks in Kenya respectively. On the contrary, Vianney (2013) found a negative relationship between capital requirement and return on assets of commercial banks in Rwanda. The variations in the findings of the study and that of Vianney may be linked to the various contexts of the studies. Additionally, due to different economic and regulatory conditions of Kenya and Rwanda, the findings may not necessarily be the same.

The findings of the study on liquidity regulation and profitability of commercial banks indicate that liquidity regulation has an insignificant negative effect on profitability of commercial banks listed at the Nairobi Securities Exchange, Kenya. The negative effect of liquidity regulation on profitability can be attributed to the notion that though profitability of commercial banks is improved for those banks having some liquid assets, holding too much of it depletes the profits of banks. Holding too much of liquid assets may also have significant costs in terms of reduced bank profits as banks with highly liquid assets may have lower income since liquid assets are less risky assets, therefore, they generate lower returns. The findings are in agreement with those of Vianney (2013) and Kahuthu (2016) who established a negative relationship of liquidity regulation and profitability for Rwanda Commercial Banks and Deposit Taking Savings and Credit Cooperative Societies in Kenya.

As expected, the findings of the study also reveal that credit risk regulation as measured by the ratio of nonperforming loans to total loans has a significant negative effect on profitability of commercial banks listed at the Nairobi Securities Exchange, Kenya. This is in line with the notion that the financial intermediation role performed by banks entails the granting of loans to customers, as such, higher levels of nonperforming loans result in lower profits generated by banks. In addition, a higher ratio of nonperforming loans to total loans implies higher level of bad debts which are subsequently written off against profit. In variation to the findings of this study is that of Mohamed *et al.* (2017) who found that credit risk regulation has a significant positive effect on profitability of commercial banks in Kenya. However, the study was based on primary data (questionnaire).

Similarly, Ndolo (2017) found that credit risk regulation has an insignificant negative relationship with profitability of banks. However, the study used ROE as against ROA which was used in the present study.

V. Conclusions and Recommendations

The study examined the effect of prudential regulations on profitability of commercial banks listed at the Nairobi Securities exchange, Kenya. The study focused on the period 2013 to 2017 where research data was extracted from the financial statements of commercial banks. Using panel regression analysis, the findings of the study reveal that both Capital adequacy regulation and credit risk regulation have significant effects on the profitability of commercial banks in Kenya. The study therefore concludes that prudential regulation is key in determining the profitability of commercial banks. As such bank managers should put in place effective credit risk management policies and embark on efficient risk minimization practices. Additionally, bank should maintain additional buffer above the minimum capital requirements for purposes of reducing the risk of any regulatory costs associated with failure to meet the stipulated capital requirements.

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