



Strathmore
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**A STUDY ON THE EFFECT OF CAPITAL ADEQUACY ON FINANCIAL
PERFORMANCE OF COMMERCIAL BANKS IN KENYA**

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DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the Research Project contains no material previously published or written by another person except where due reference is made in the Research Project itself.

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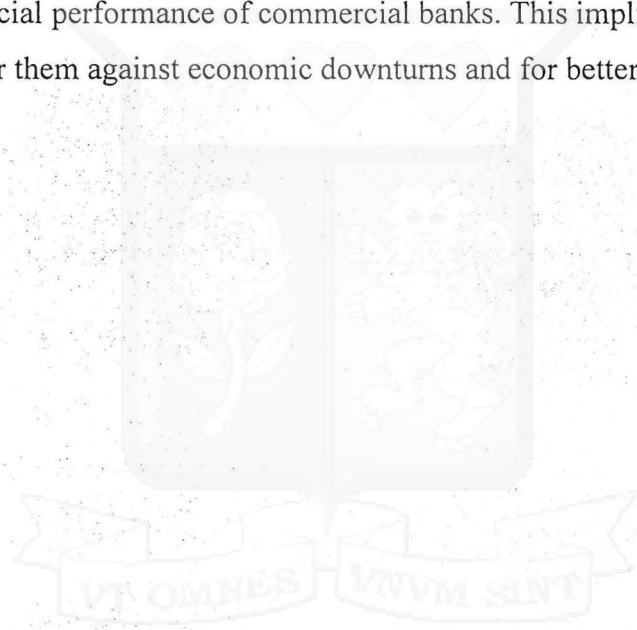
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ABSTRACT

Prudential soundness in the financial system is ensured through better self-regulation of factors such as capital adequacy, management quality and asset quality. Capital adequacy as a bank specific factor revitalizes the functioning of the banking system by acting as a buffer for losses during an economic downturn yet at the same time its use in projects leads to substantial returns. This study seeks to assess the extent to which capital adequacy affects the Return on Equity and Return on Assets for commercial banks in Kenya. A regression analysis using STATA software was performed for the panel data collected from 6 commercial banks in the NSE from 2007-2016. The results from the analysis show that a unit increase in CAR increases ROE by 0.0558141 and increases ROA by 0.2033251. Based on the findings, capital adequacy plays a vital role in the financial performance of commercial banks. This implies that banks should hold more capital to buffer them against economic downturns and for better financial performance.



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Table of Contents

CHAPTER ONE: INTRODUCTION	1
1.1 Background to the study	1
1.2 Statement of the Problem	5
1.3 Research objectives	5
1.4 Research questions	6
1.5 Justification of the study	6
1.6 Scope of research	6
CHAPTER TWO: LITERATURE REVIEW	8
2.0 Introduction	8
2.1 Theoretical Literature	8
2.2 Empirical Literature	10
2.3 Discussion of works	14
2.4 Conceptual Framework	15
2.41 Return on Equity (ROE).....	16
2.42 Return on Assets (ROA)	16
2.42 Capital adequacy	17
2.5 Highlights of the work.....	17
CHAPTER THREE: RESEARCH METHODOLOGY	19
3.0 Introduction	19
3.1 Research Design.....	19
3.2 Population and sample of study	19

3.3 Data Types and Data Sources.....	20
3.4 Data Analysis	20
3.4.1 Multiple Regression Model	21
3.4.2 Correlation Analysis.....	22
3.4.3 Test of Significance.....	22
CHAPTER FOUR: RESULTS.....	23
4.0 Introduction	23
4.1 Graphical Results	23
4.11 Standard Chartered Bank.....	23
4.12 Kenya Commercial Bank	24
4.13 NIC BANK.....	25
4.14 I&M BANK.....	26
4.15 NATIONAL BANK.....	27
4.16 EQUITY BANK.....	28
4.2 Regression Analysis	29
4.3 Correlation.....	30
CHAPTER 5: DISCUSSION, RECOMMENDATIONS AND CONCLUSIONS	31
5.1. Introduction.....	31
5.2 Discussion	31
5.3 Link to Literature Review	33
5.4 Implication for the study	35
5.4 Limitations of this study.....	35
5.5 Recommendations for further studies.....	36
5.6 Conclusion.....	36
References	37

CHAPTER ONE: INTRODUCTION

1.1 Background to the study

The abhorrent effect of a situation where the banking system has failed would be an outcry to many. Millions of people would lose their assets, a lot of payments would go unpaid, the GDP would fall and the government debt would accumulate having guaranteed bank loans. Such consequences emphasize on why the government and other stakeholders are enthralled in the financial performance of banks. The existence of banks back dates to nearly 700 years ago with the establishment of a chamber of loans at Venice (Richard, 2001). Aimed at lending the republic of Venice funds to enable its operations after war, the main role of the institution was to collect loans at punctual dates. With time, Venice merchants took their deposits to the institution for security and the depository role emerged (Richard, 2001).

Over the years, banks have grown largely in numbers with their immense contribution to the economy being greatly valued (Richard, 2001). With nearly 8,000 banks in the United States and over 300 banks in Japan, competition in the industry has grown ten-fold. In as much as the banking system varies in different countries in terms of structure and the fray of activities it adopts, banks have one sole function which is to pool funds from investors and lend them to deficit units (B.Thomas, 2006). Expansion of such financial services by commercial banks is an anchor that the vibrant economic growth in Sub-Saharan Africa is also pegged on.

Indeed, the European Investment Bank Report 2015 lists Kenya as a primary contributor to the regional expansion of banks in Sub-Saharan Africa placing it as an accelerator of economic growth in the region. The regional flag bearer as identified by The European Investment Bank (2015) is Kenya. This study therefore examines to what extent capital adequacy affects the level of financial performance of commercial banks in Kenya.

Kenya has 42 commercial banks, 13 microfinance banks and 1 mortgage finance company. According to CBK 2016 Annual Report, an upward trajectory of bank's improved performance is attributed to growth in assets, loans and advances, the deposit base and profit before tax. Currently the level of profits of the banks in Kenya as reported by CBK (2016) is 81.2 billion pretax profits. This is a 5.9% increase from the previous year mainly attributable to increase in earnings from

investing in government securities (CBK, 2016). However, qualms about the banking sector have been recently raised in Kenya following the closure of Dubai Bank, Imperial Bank and the recent receivership of Chase Bank among many banks whose performance quivers the credibility of the financial sectors (CBK, 2016, p. 70). The relevance of capital adequacy in curbing the loss of confidence in the banking system is brought out by Bichsel and Blum (2004) who explain that capital adequacy reduce negative externalities such as disruption of the payment system.

Indeed, Witherell (2002), points out that a strong financial system involves great expertise in terms of governance. Governance in the financial system revolves around ensuring prudential soundness and a high level of earnings. To enable this, Witherell (2002), points out that bank supervisors monitor performance of banks using systems that involve factors such as capital adequacy, management quality and asset quality. This calls out for the need for monitoring and evaluation of the factors to track achievements and enable efficiency (Sera, 2007).

Bank performance measures as identified by Mishkin (2007) are Return on Equity (ROE), Return on Assets (ROA) and Net Interest Margin (NIM). ROA is defined as a measure that indicates how well a bank utilizes its assets to generate its profit. It is calculated as $\text{Net Income} / \text{Assets}$. ROE is a measure that indicates the level of earnings per unit of investment. This shows how much return a shareholder's capital is generating. It is calculated as $\text{Net Income} / \text{Capital}$. NIM on the other hand measures how well a bank uses its assets to generate interest income. It is given as $(\text{Interest income} - \text{interest expense}) / \text{Assets}$.

All the three levers measure performance. For this study, ROE will be used as the best measure as it is the product of Profit margin, Asset turnover and financial leverage (Higgins, 2009). The ROA and ROE are seen to move in the same direction given the fact that $\text{ROA} = \text{profit margin} * \text{asset turnover}$ and is thus encompassed in ROA. Mathuva (2009) points out that analysts and regulators have employed use of ROA and ROE to measure the bank performance especially where bank profitability is desired. Further, ROA will be used as it is a popular measure and can be used for comparison against the previous ROA or a similar company's ROA (Abondo, 2013). Given such a preamble, this study aims at examining the extent to which capital adequacy determines the level of profits in terms of ROE and ROA.

The determinants of profits as identified by Al-Tamimi(2010) are bank specific factors and macro-economic factors. Bank specific factors influence a given bank and are seen to be mainly determined by the management and the board and thus are also known as internal factors. Macro-economic factors affect the industry in general and include variables such as inflation and are beyond a bank's control Al-Tamimi (2010). Macroeconomic factors such as inflation and GDP levels will not be of essence in this study as Fadzlan (2012) finds a negative correlation between such factors and the level of performance. Moreover, Al-Tamimi, (2010) explains that macro-economic factors are beyond the companies' control and therefore of little significance for this study.

Capital adequacy as one of the bank specific factors has been at the center of most studies and at the focus by bank regulators as it is one of the main drivers of the profitability of a financial institution (Mathuva, 2009). Examining the capital adequacy could be used to reflect the performance health of a bank and potentially buffer it from a down trail. While assessing the determinants of bank profitability, Samoei (2014) refers to capital adequacy as the amount of equity that is available to sufficiently absorb shocks in case of an economic downturn. The effect that capital has on financial performance should be examined as capital invariably determines the amount of funds that are available for loans which is a major source of income for banks as pointed out by (Ojiambo, 2014).

Capital adequacy as brought out by Mathuva (2009) represents how much funds banks hold that enable them to extend credit. These funds are in the form of deposits and borrowings by the banks. The prudential guidelines by the Central Bank of Kenya require the commercial banks to adhere to minimum ratios set out by maintaining a core capital to total deposits ratio of not less than 8 percent. Further, the measure of capital adequacy is used as the core capital / the total assets denoting the Capital Adequacy Ratio (CBK, 2016). By trying to determine the relationship between the capital adequacy and the bank profitability, Kiragu (2010) uses the Capital Adequacy Ratio as a measure of capital adequacy.

Studies that have been done in Kenya to try explaining the relationship that exists between capital adequacy and a bank's profit are conflicting. A positive relationship is evident in Mathuva (2009) work that seeks to establish the effect that cost income ratio has on the performance of kenyan commercial banks. His work further supports the CBK's decision to raise the capital levels that is

in line with Basel 111 requirements. However, Kiragu (2010) analyzes the impact the level of capital has on the 44 commercial banks in terms of performance for the period 2004-2009. By using CAR as the year end measure of capital, the study finds out that there is no significant relationship between the level of capital and ROE. The capital has a negative relationship with ROA and is thus not a significant determinant.

Notably, Basel 111 guidelines have played an important role in ensuring compliance of a bank's capital requirement within a given capital buffer (Atkinson, 2010). In a bid to raise the transparency, consistency and quality of the capital base, Atkinson (2010) discussed the proposals brought forward by Basel 111. Tier 1 capital requirement increased from 4% to 6% with common equity increasing from 2% to 4.5%. Additional capital buffers that were introduced include the capital conservation buffer and the counter-cyclical buffer to control the impact of huge losses. The intended purpose of Basel is however not reached because of the regulatory arbitrage that occurs where leverage is expanded in a relatively unchecked manner. This has been noted to lead to the perverse outcome during the crisis as the Basel weighting of assets allowed for capital arbitrage which led to high leverage and consequently exposed firms to high risk (Atkinson, 2010).

Prudential guidelines by the Central Bank CBK (2016) point out that the minimum capital ratios for core capital to total risk weighted assets is 10.5% while total capital to total risk weighted assets of is 14.5%. Kenya increased the core capital buffers from 15.7 percent in June 2015 to 16.3 percent in June 2016 whereas the total capital remained unchanged at 18.9 %. The minimum, capital requirement increased from 1 million to 5 million shillings. With the new improvements being welcome, a key concern in the reforms with regards to Basel is setting a given level of capital that banks with different structures and diverse jurisdictions will see as enough. (Atkinson, 2010) points out that this is a huge concern as banks prefer holding less so as to maximize their return on equity.

Given such a background, this study seeks to assess the relationship between capital adequacy and bank profitability in terms of ROE and ROA. The Capital Adequacy Ratio (CAR) as used by analysts and bank regulators will be used as a standard measure for comparison. The conflicting results of previous studies make it necessary for this study to be carried out. Further, the study aims to test the underlying theory that supports capital adequacy as a major determinant of ROE and ROA.

1.2 Statement of the Problem

Kenya Vision 2030 aims to ensure stability in the financial sector by minimizing the chances of a financial crisis. Better self-regulation is seen to be one of the ways that will ensure soundness in the financial system of the functioning banks promising success (Kenya Vision 2030, 2012).

The relevance of capital adequacy as an explanatory variable in determining a bank's ROA and ROE has been emphasized. By analyzing six Kenyan commercial banks in the period 2006-2012, Ojiambo,(2014) finds a negative relationship exists between the capital adequacy and the bank profits. This is further supported by Kiragu (2010) while trying to establish the impact the level of capital has on the 44 commercial banks in terms of performance.

In contrast to the studies given, Mathuva (2009) while trying to examine the effect of cost income ratio on the performance of Kenyan commercial banks finds a positive relationship between capital adequacy and profitability. By taking CAR of Tier 1 as a proxy for capital adequacy, Sharma (2016) establishes a positive relationship between capital adequacy and profitability. To further support the positive relationship, Kusa (2013) finds out that Capital Adequacy Ratio, used as a proxy for capital adequacy has a positive relationship to ROA and NIM. However, CAR relates negatively to the ROE. Kusa(2013) explains that this is conventional argument that firms with higher CARs go for less risky assets.

Ground has been broken to try explaining the relationship capital adequacy has on the level of profits. However, such research has led to conflicting results calling for a need to reexamine the same. This study therefore seeks to examine the relationship that exists between CAR and financial performance of Kenyan commercial banks, specifically the ROA and ROE.

Albeit the different scenarios, this study will aim to establish the extent to which the Capital Adequacy Ratio influences the ROA and ROE of publicly listed banks in the Nairobi Securities Exchange.

1.3 Research objectives

- 1) To examine the extent to which the capital adequacy ratio influences the Return on Equity.
- 2) To assess the extent to which capital adequacy ratio affects the Return on Assets.

1.4 Research questions

- 1) How does the capital adequacy ratio influence the Return on Equity?
- 2) How does the capital adequacy ratio affect the Return on Assets?

1.5 Justification of the study

Central Bank of Kenya as the regulator of commercial banks can use the study in establishing policies. This will assist commercial banks to improve their financial performance and enable them to achieve the vision 2030 goal of better self regulation minimizing the likelihood of a potential bank collapse and lucrative performance of the banks and by that attract more investors helping boost the economy.

This study will also be of benefit to private investors by helping them understand the Kenyan banking sector. Such investors will be able to make informed decisions before investing by analyzing the overall impact on profitability. In order to boost growth in their investments, investors in the banking industry can lobby the government for more favorable policies.

The findings of this study will be of interest to the management of commercial banks as the bank managers will be able to come up with self-regulation policies with regard to the capital adequacy. This will be favourable to the shareholders of commercial banks and could improve the performance of the economy. Further, academicians and scholars may use the findings for further research on the topic.

1.6 Scope of research

The scope of research will cover 6 commercial banks that are publicly listed in the Nairobi securities exchange. This will be for a period of 10 complete financial years from 2006-2016. The banks under this research will be the following as guided by Nairobi Securities Exchange listed

companies and randomly selected as Kenya Commercial Bank, Equity Bank, Standard Chartered Bank, National Bank, NIC Bank and I&M Bank.

The secondary data for the period will be obtained from annual financial statements. This will be the total earnings and the total assets. This will give the capital adequacy ratio. To obtain the return on equity the net profit after taxes and the equity capital will be used whereas for return on assets, net profit after taxes and total assets will be used.



CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

The chronological order of the following chapter is as follows: the theoretical literature, the empirical literature, discussion of works, conceptual framework and the highlights of the work.

2.1 Theoretical Literature

The Agency Cost Theory

Agency Costs represents the costs incurred while trying to minimize the conflict of interest between shareholders and managers. In order to have congruent goals with those of shareholders, managers are given incentives such as shares and performance-based costs. Other costs associated with the agency problem include costs of attaining auditors and implementing internal controls.

Jensen and Meckling (1976) argue that agency costs are crucial in determining the type of financing that firms employ. Particularly, they advocate for the use of debt as an incentive to minimize costs that arise due to agency problems. Rather than obtaining more equity capital from the market, Jensen and Meckling (1976) suggest that use of debt is more profitable. This is because the number of shareholders is maintained and instead of dealing with conflicting interests of managers and the additional disgruntled shareholders, the managers now deal with creditors.

Given that the creditors have a more compelling effort on the company in case of a financial distress, their needs are met first. Managers with the fear of losing their jobs have to operate the bank efficiently so as to pay interests due on the debt from creditors. This serves to align their objectives congruent to those of shareholders; shareholder's wealth maximation. As such equity capital is not advocated for as it warrants for potential agency costs.

The theory implies that the greater the capital the bank holds, the less the profits. A lot of equity capital will lead to more agency costs reducing the profits as shareholders try to align their goals with those of managers. The theory holds that to minimize such costs, banks should borrow more to finance their activities. Therefore, the more the equity capital, the less the efficiency.

The Signaling Theory

The signaling theory as proposed by Berger (1995), views capital as the level of equity relative to assets that a bank holds and has an important role in maximizing the value of a firm. The capital ratio of a bank is increased in order to minimize the costs associated with a financial distress. Therefore, to reduce the costs of debt in cases where lenders expect financial distress, banks increase their capital ratio to the extent that the reduction in tax benefits of debt offsets the reduction in extra costs associated with financial distress.

Due to asymmetric information in the market, the actions of bank managers are seen as signals of the prospects of a bank. Capital decisions act as a signal concerning the health of a company. Higher capital signals a better bank in terms of private information indicating better prospects on the value of a firm. If a firm has many profitable projects in which it wishes to engage, the firm raises more capital to fund such projects.

Further, banks hold capital as a buffer in case of profitable investment opportunities that were not expected. Rather than borrowing from the public at high transaction costs in the event of occurrence of such opportunities, banks use their own capital. The holding of high levels of capital by the firm therefore signals a profitable bank; one that expects to venture into projects with a high rate of return.

Bankruptcy Theory

Berger (1995) argues that higher amounts of equity capital are held during bankruptcy to facilitate payment of debt at lower rates charged. The deadweight costs associated with bankruptcy call for higher capital levels. The Capital Adequacy Ratio increases considerably during periods of financial distress to prevent further failure. This in turn lowers the bankruptcy costs that would occur in case of failure such as costs that are borne by creditors and consequently transferred to shareholders.

In case of an exogenous factor that would lead to a bank failure, Berger (1995) explains that banks which quickly adjust their CAR would be at an advantage. This is seen when such banks pay lower interest rates for their uninsured debt during turmoil. Consequently, this increases their ROE all factors held constant. Given that such an exogenous factor that results in bank failure would reduce

the ROE, a bank that quickly adjusts its CAR will have a higher ROE in comparison to other banks. This potentially calls for the need for more capital in times of distress to be able to make good of an otherwise disastrous situation.

2.2 Empirical Literature

A lot of research has been done to determine the factors that determine a bank's profitability either through explaining how the ROE, ROA or NIM is affected. Most work has focused on internal factors (bank-specific) which are seen to determine the profitability of a specific bank and are within the managerial control (Al-Tamimi, 2010). Bank specific factors as identified by Sharma (2016) and Fadzlan (2012) include bank size, capital adequacy, liquidity, management capability and asset quality. Other studies also consider macroeconomic factors such as GDP, Inflation and money supply to try explaining how such factors affect the level of profits.

This study focuses on examining how bank specific factors particularly capital adequacy and the size of the bank affects the level of profits.

Several researchers have carried out research on the effect of capital adequacy on bank performance. While some point out that there is a positive relationship between bank profits and capital levels, other findings show a negative relationship between the two variables. The effect of capital should be investigated since as pointed out by Ojiambo (2014), capital invariably determines the amount of funds that are available for loans which is a major source of income for banks.

Naceur & Khandil (2013) point out that in as much as capital requirements are necessary to act as a buffer during an economic downturn, capital requirements have had a significant effect on credit expansion. Particularly, capital requirements is seen to drive down lending requirements as banks pay attention to their capital positions. This has been observed in Canada, New England and the United Kingdom following the toughened monitoring in compliance to Basel 1 requirements. As banks try to adhere to the strict rules put in place, the loan supply declines leading to lower profitability. Such requirements increase the minimum capital requirement leading to a further decline in the banking sector. However, counter arguments point out that the regulation does not affect the profitability as much given that a bank could by its own choose to maintain a higher

Capital Adequacy Ratio (Ashcraft, 2001). As seen in the Kenyan market, there is no conventional agreement on the relationship of capital adequacy with bank profits.

Ojiambo(2014) finds a negative relationship between Tier 1 capital, Tier 11 capital and the bank profits. Tier 1 capital represents common stock and retained earnings whereas Tier 11 capital is composed of additional capital for instance revaluation reserves. By analyzing six Kenyan commercial banks in the period 2006-2012, Ojiambo,(2014) finds inconsistent results with NIC, Co-operative and Equity Banks showing a negative relationship with increase in the capital level. Evidently, an increase in Tier 1 capital with all other factors held constant will lead to a decrease in profit before tax by 12.8% for NIC bank, 16.84% in Co-operative Bank and a whopping 89.1% for Equity Bank. However, Kenya Commercial Bank, CFC and Standard Chartered showed a positive relationship with the bank profits for the six years. The study uses banks in different tiers for the study showing objectivity. This study will also employ stratified sampling within the different levels to investigate whether the conclusions are accurate.

While assessing the determinants of bank profitability, Samoei (2014) refers to capital adequacy as the amount of equity that is available to sufficiently absorb shocks in case of an economic downturn. This is evident as well capitalized banks have a lower possibility of being bankrupt reducing their costs. As pointed out a higher equity to assets ratio translates to more profitability as the need for external funds is reduced.

In a study to determine the consequences of changes on equity capital on lending rates of Kenyan commercial banks, Adoli (2014) assesses 29 commercial banks for a period of 16 years. The study finds out that there is a strong positive relationship between equity capital changes and the lending rates. This shows that if there is a new capital requirement, banks will increase their loan rates or reduce their loan supply so as to minimize costs associated with acquisition of additional funds.

To determine how bank specific factors, affect the level of liquidity, Sharma (2016) uses correlation analysis, regression analysis and pooled OLS regression model. He finds out that capital adequacy has a positive impact on the liquidity but the bank size has a negative relationship with bank liquidity. By taking CAR Tier 1 as a proxy for capital adequacy, the positive relationship is explained by the fact that banks expected to maintain less liquidity have low CAR. With a

coefficient of 0.13 and a p-value of 0.02 capital adequacy has a statistically positive impact on liquidity. This explains that a higher level of capital allows for more liquidity.

Fadzlan(2012) investigates the determinants of profitability on Bangladesh Commercial Banks from 2000-2010. The study is important in this review as it studies potential bank specific determinants and additional control variables that cover the interests of this study. He uses a standard regression model, panel data regression model and Spearman & Pearson correlation matrix to analyze the data for 31 commercial banks. His analysis yields a positive result between capital and performance of commercial banks. This he explains is the case since high levels of capital minimize bankruptcy costs while trying to obtain external financing.

Were (2013) studies factors that drive performance for commercial banks in Kenya. Were (2013) investigates the impressive financial performance by conducting an analysis from 1997-2011. The role of structure and efficiency in influencing performance is tested through employing Data Envelopment Analysis (DEA). The study finds out that superior performance in the Kenyan banking sector is due to the structure in place and not efficiency. The technical efficiency is discussed and an emphasis given to market powers. However, the study did not look into capital adequacy which is a focal point in this study.

Kusa (2013) reviews factors that determine the level of profitability of commercial banks in Kenya. He uses the CAMEL approach which comprises of Capital Adequacy, Asset quality; Management Ability, Earnings Ability and Liquidity as factors that influence the level of profits. Capital adequacy is seen to be primal as it helps buffer a company against losses that arise due to exposure to risks such as market risk, operational risk or credit risk. The study finds out that the Capital Adequacy Ratio, used as a proxy for capital adequacy has a positive relationship to ROA and NIM. However, CAR relates negatively to the ROE. Kusa (2013) explains that this is a conventional argument that firms with higher CARs go for less risky assets. This study is relevant as factors that determine the commercial banks in Kenya are discussed and seen to be congruent with those listed in the prudential guidelines of the Central Bank (CBK, 2016).

To further support the relevance of capital adequacy as a predictor variable, Kiragu (2010) analyzes the impact the level of capital has on the 44 commercial banks in terms of performance for the period 2004-2009. By using CAR as the year end measure of capital, the study tries to find

out the effect of capital on ROE and ROA, Interestingly, he finds out that there is no significant relationship between the level of capital and ROE. The capital has a negative relationship with ROA and is thus not a significant determinant. Having obtained a p-value greater than 0.05, capital is seen to be an insignificant determinant of ROE. This is in contrast to the theories brought forward by Berger (1995) and Jensen and Meckling (1976) that try to explain the effect of capital on ROE. The study will be relevant as Kiragu (2010) focused on the period just before the global financial crisis. This study will focus on post global crisis and seek to establish whether the relationship still holds.

To determine how a bank's liquidity and capital affects its operating efficiency, Odunga(2013) finds out that there is a significant relationship of capital with the operating efficiency at a confidence level of 95%. This shows that banks with high levels of capital can conduct their daily operations with ease and can buffer themselves from potential losses in case of a crisis. However, Gatete (2015) finds that there is a negative relationship between capital and profitability with correlation scores of $R=-0.03$. The two conflicting findings form a pivot for this study as the relationship between the financial performance and capital adequacy remains unclear. The differing conclusions beg the question on whether the right methodology is used or whether the period of study raises the discrepancies. Gatete (2015) uses multiple regression models to investigate the relationship between capital and profit for the 43 commercial banks.

Murerwa(2015) in his study of determinants of financial performance for commercial banks in Kenya points out that a bank that is large has lower costs of raising capital, are able to expand geographically making more profits. This is also attributed to the fact that larger banks have the capacity to enter into more strategic partnerships that are innovative and engage in larger investments. However, he sees no consensus on whether increased assets lead to improved financial performance. By analyzing the 44 commercial banks, he finds out that there exists a positive relationship between capital adequacy and the level of performance. His findings for capital adequacy give a positive relationship show that the two variables are significant determinants of bank performance. This validates the purpose of the study.

2.3 Discussion of works

The results of the analysis are ambiguous as there is no consistent result on the effect of capital adequacy to the ROE or ROA of a bank. This calls for the need for further research for conclusive or explanatory findings.

The theories in question are either supported or contrasted by the empirical literature. Such include the findings by Kiragu (2010) who finds a negative relationship between capital adequacy levels and ROE. By performing a regression of the CAR against ROE and ROA for Kenyan commercial banks for the period 2009-2014, a negative coefficient is obtained. This is seen to show that there is no relationship between capital adequacy and profitability as measured by ROE and ROA. Such research contrasts theories brought forward by Berger (1995). The signaling theory for instance explains that there is need for more capital during periods of distress and that such high capital meets the deadweight costs associated with bankruptcy. However, since no relationship has been established, Kiragu (2010) could dismiss the holding of such a theory.

Adoli (2014) however obtains findings that are consistent with the positive theories. In his assessment of 29 Kenyan commercial banks between periods of 26 years, he finds a positive relationship between the amount of capital held and the level of profits obtained. To further explain the positive relationship, he explains that banks will have a positive relationship between equity changes and cost of loans. This is in an effort to reduce the cost of acquiring loans and by thus be able to meet new capital requirements through additional debt.

The above rationale is supported by Naceur (2003) who points out that banks credit expansion is determined by the level of capital held. In compliance to the Basel requirements imposed on banks, banks lower their loan supply so as to hold on higher amounts of funds. The above leads to a decline in loan performance which affects profitability since banks mainly rely on loans as their main source of income. Such an argument is countered by Ashcraft (2001) who holds that banks determine their own levels of CAR and that this does not depend on the capital requirements or regulations.

Drawing from international examples, Fadzlan (2012) establishes a positive relationship between bank performance and capital adequacy. With a sample of 31 Bangladesh banks, Fadzlan (2012) uses standard regression model, panel data regression model and Spearman & Pearson correlation

matrix to analyze the relationship. The positive relationship is explained by the fact that banks hold a high level of capital to minimize the effects of an economic downturn or bankruptcy. Such findings are explained by the signaling and bankruptcy theory brought forward by Berger (1995).

In sharp contrast to this, Kusa (2013) finds that banks with higher levels of CAR go for less risky assets. This is seen as safe since a lot of capital is in question and banks would therefore be hesitant on the high risk high return projects. Such findings disapprove strong theories such as the signaling theory by Berger that explains that if a bank has high levels of capital it expects profitable opportunities in the future and therefore keeps the CAR high. The positive relationship between the level of capital held and profits established by Kusa (2013) is also supported by Odunga (2013) at a confidence interval of 95%.

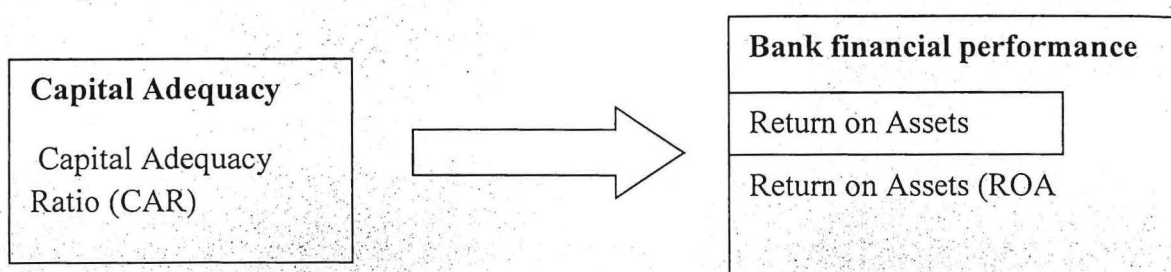
Other negative relationships are seen by Gatete (2015) at a coefficient of $R=-0.03$ and by Ojiambo (2014) who finds a negative relationship between Tier 1 capital, Tier 11 capital and the levels of profit. As brought out by Ojiambo (2014) an increase in the level of capital with all other factors held constant leads to a decrease in profits. This contravenes the agency cost theory, the bankruptcy theory and the signaling theory. Samoei (2014) however finds a positive relationship on analyzing Kenyan commercial banks and explains the high profitability by the fact that banks with high levels of capital have lower needs for external funds and can exploit new opportunities as they arise.

Clearly there is a need to examine the effects of capital levels on profits as the empirical literature gives inconsistent finding from the theoretical findings. Further, Ojiambo (2014) asserts that capital invariably determines the amount of funds that are available for loans which is a major source of income for banks.

The independent variable, capital adequacy needs to be examined further to establish empirical evidence with the ROE and ROA which is the purpose of this study.

2.4 Conceptual Framework

A conceptual framework shows the relation that exists between the variables under study.



Predictor variable**Dependent variable**

The independent variable under this study is the proxy for capital adequacy, the capital adequacy ratio (CAR) while the dependent variables are Return on Equity (ROE) and Return on Assets (ROA)

2.41 Return on Equity (ROE)

Return on Equity measures the net profit after taxes per unit of invested capital. It shows how much the bank is earning on the shareholder's investments.

$$ROE = \text{Net profit after taxes} / \text{Equity capital}$$

Higgins (2009) points out that the yardstick of financial performance for managers and investors is the ROE. Its superiority in measuring the financial performance is due to the fact that ROE is a measure of efficiency of how a company employs the shareholder's capital. Given that the main goal of a firm is shareholder's wealth maximization, ROE is placed as an accurate measure of that. From the perspective of the shareholder, the ROE can therefore be used to compare investment opportunities.

2.42 Return on Assets (ROA)

The ROA shows how efficiently the bank utilizes its assets to generate earnings. Eashkins (2007) notes that Return on Assets (ROA) is directly related to the Return on Equity. This is through multiplication with the equity multiplier that shows the amount of assets per unit of capital.

$$ROA \text{ is calculated as: } ROA = \text{Net profit after taxes} / \text{Total assets}$$

The equity multiplier (EM) which explains the direct relationship between ROE and ROA is given as:

$$EM = \text{Assets} / \text{Equity Capital}$$

Therefore, ROE is a product of ROA*EM given as:

Net profit after taxes= Net profit after taxes* Assets

Equity Capital

Assets

Equity Capital

The above equation shows what returns are obtained if a bank holds different levels of capital given that the amount of assets held is equal. According to Eashkins (2007) if banks with the same amount of assets are equally well run such that the ROA is the same, the bank with the lower capital (larger equity multiplier) gives a higher return. This explains why owners of a bank will not want it to own a lot of capital.

2.42 Capital adequacy

Capital as pointed out by Mathuva (2009) refers to deposits, long term borrowings and equity that act as a source of funds to the bank. Naceur (2003) explains that a bank that is well capitalized is likely to have better performance as it can invest in arising opportunities without need to raise additional capital. This profitability also stems out from the resistance to bankruptcy leading to cost savings on bankruptcy and financial distress and is thus an argument held by many researchers.

As demonstrated by Fadzlan (2012) the capital adequacy of a firm can be measured by earnings/total assets. Kiragu (2010) uses the Capital Adequacy Ratio as a measure of capital adequacy. The CAR in this context is defined as the value of the year end reserves plus capital divided by assets. This confirms to the prudential guidelines by the CBK in regards to capital adequacy. Therefore, the capital adequacy ratio (CAR) will be used for this study and will be measured by:

$$CAR = \text{earnings} / \text{total assets}$$

In as much as the coefficient of capital adequacy is expected to be positive, Berger (1995) explains that lower capital ratios show relatively risky positions. This could lead to a negative coefficient as observed by Kiragu (2010) on regressing the CAR against the ROA and ROE for Kenyan banks from 2004 to 2009. For the purpose of this study, the CAR will also be used as a proxy for capital adequacy.

2.5 Highlights of the work

Indeed, capital adequacy is seen to affect the ROE and therefore the profitability of commercial banks. Research done by Kusa (2013), Kiragu (2010) and Sharma (2016) point out that the measure

of capital adequacy is the CAR. This is further supported by CBK(2016) that identifies CAR as a measure of capital adequacy. It entails the core capital (reserves) and total capital to total risk weighted assets. The CAR will be used as a proxy for capital adequacy respectively as it is a conventional measure.

Additionally, the ambiguities that exist between the predictor variables and the dependent variable have been highlighted. There is no conventional conclusion of how capital adequacy affects the financial performance relates to ROE and ROA.

Similarly, contradictory results have been observed when relating capital adequacy and financial performance. Whereas Adoli (2014), Kusa (2013) and Samoei (2014) observe positive relationships between bank profitability and the capital held, Kiragu(2010), Gatete(2015) and Ojiambo(2014) observe negative relationships. Such ambiguities essentially call for the need for further research as many theories such as the signaling and bankruptcy theory strongly affirm that high levels of capital are better for banks.

Other new explanations have come up. The negative relationship between capital adequacy and financial performance has been explained by (Kusa, 2013) to arise where banks with high levels of capital choose safer assets. The lower risks translate to lower returns and thus lower ROE for the given bank. Further, the argument to that credit expansion affects level of capitals held by a bank is countered by Ashcraft (2001) who holds that banks determine their own levels of CAR. Such dimensions have not been discussed in the theories and thus are new perspectives in the field.

Similar research methods that have been extensively used in the literature reviewed. Most researchers have employed the use of Pearson correlation, ANOVA and the multiple regression models in their analysis. Multiple regression models help explain the influence of a variable to another. However, Campbell (2008) points out that in the case where one has two highly correlated variables, one has to be dropped. Since the independent variables in this study are two and that the study seeks to explore the relationship between the predictor variables and the dependent variable, multiple regression models will be relevant Campbell (2008). The study will establish the extent to which the Capital Adequacy Ratio influences the ROA and ROE of publicly listed commercial banks in the Nairobi Securities Exchange.

CHAPTER THREE: RESEARCH METHODOLOGY

3.0 Introduction

The methodology employed in establishing the extent to which capital adequacy affects the overall financial performance is discussed in the following chapter. The nature of study, sources of data, population and sample and the models that were performed on the data are discussed.

3.1 Research Design

The research design refers to the overall plan to conduct a study with the aim of achieving a given objective and answering research questions.

The study is an explanatory study. As defined by Saunders (2009), an explanatory study aims at establishing causal relationships between variables. This study seeks to establish the extent to which the capital adequacy ratio influences ROA and ROE. By doing so, the study also establishes the relationship that exists between capital adequacy ratio and the overall financial performance indicated by ROE and ROA.

This study is quantitative in nature. This is because the study involves data collection techniques and data analysis procedures that generate numerical data. The data collection involved use of capital adequacy ratios as a proxy for capital adequacy given by earnings/ total assets. When data analysis procedures such as correlation and multiple regression methods were employed, numerical data was consequent. The numerical data was obtained from the annual financial statements of the commercial banks.

Since the data employed in this study involves more than one variable for different companies over many years, data analysis procedure for panel data was used.

3.2 Population and sample of study

Eashkins (2007) defines a population as an entire group of individuals, events or objects with a common observable characteristic. The population of this study was all commercial banks in Kenya (41 in number).

This study analyzed a sample of 6 commercial banks that were randomly selected from the Nairobi Securities Exchange. These commercial banks are publicly listed commercial banks whose

financial statements were readily available. This was in a bid to determine the extent to which capital adequacy affects ROE and ROA for the commercial banks.

The CAR was regressed against the ROA and the ROE separately so as to achieve the objective of measuring the extent to which the CAR influences the ROA and the ROE. Saunders(2009) states that stratified random sampling has low relative costs and gives better comparison of the entire population giving it an upper hand over the other sampling techniques. The randomly selected banks for this study were Kenya Commercial Bank, NIC Bank, Equity Bank, National Bank, CFC Bank and I&M Bank.

3.3 Data Types and Data Sources

The study uses secondary data; specifically, annual data sources for bank specific variables. Particularly, the proxies for capital adequacy ratios (CAR) which is owner's capital/ total assets were pulled from the annual financial statements of the six commercial banks.

The capital adequacy ratio was computed as earnings (net profit after tax)/ total assets. This regressed against the net profit after tax / equity capital (ROE) and net profit after tax/ total assets (ROE) for the different banks.

The selected period of study was between 2006 and 2016 (10years). This was with an aim of observing the extent to which the capital adequacy ratio affects the financial performance measures over the years. The study employed panel data as it requires the study to be done for a period of 10 years on more than one variable and for each of the 6 commercial banks.

3.4 Data Analysis

Analytical models such as the regression model and correlation were used for this study. Regression is a statistical technique that is used to determine the linear relationship that exists between two or more variables. Regression is primarily used for prediction and causal inference and is therefore relevant for this study.

The regression model as pointed out by Campbell(2008) is used when exploring relationships between variables that involve establishing the effect of two or more predictor variables on a dependent variable.

The other data analysis procedure that was employed for this study was correlation studies to explain the correlation coefficient.

3.4.1 Multiple Regression Model

The general regression equation for the study was:

$$Y = \alpha + \beta_1 X_1 + \varepsilon \dots \dots \dots \text{equation 1}$$

Y=Financial Performance as measured by ROE

α = a constant

β_1 = Coefficient of independent variable (capital adequacy ratio)

X_1 = Capital Adequacy as measured by capital adequacy ratio

ε = Error Term

The regression gave a constant that is not affected by the bank-specific variables identified.

β_1 gave the coefficient that explains how the capital adequacy relates to the ROE.

$$Y = \alpha + \beta_1 X_1 + \varepsilon \dots \dots \dots \text{equation 2}$$

Y=Financial Performance as measured by ROA

α = a constant

β_1 = Coefficient of independent variable (capital adequacy ratio)

X_1 = Capital Adequacy as measured by capital adequacy ratio

ε = Error Term

For the study, the ROE measures given as Net income/ Capital was obtained for the various banks and the ratio obtained for the different years. The Capital Adequacy Ratio was obtained for the various banks as the capital/ total assets. This yielded the data in the indices as shown. A regression analysis was then performed for the various banks using STATA software. This was performed by compiling all the data as one Excel sheet and regressing the ROE against the CAR as the independent variable.

The same was done while assessing the extent to which CAR affects ROA. An additional column for the ROA was obtained by dividing the Net Income for the various banks with the Total Assets for the different years (data used is shown in the indices). The CAR variable remained as the independent variable for this analysis as well. A regression command was then performed by feeding the dependent variable (ROA) and the independent variable (ROE) to the STATA software for a regression analysis.

3.4.2 Correlation Analysis

As a compliment to the multiple regression, a correlation analysis was performed to establish the degree of relationship between the independent and dependent variable. This was analyzed using the Stata software with the command (correlate ROE CAR) for a correlation analysis between ROE and CAR and (correlate ROA CAR) for analysis of the relationship between the ROA and CAR. A correlation coefficient that is greater than 0.8 would indicate multicollinearity; a situation that exists when two variables are strongly related in which case the variable should be dropped.

3.4.3 Test of Significance

The study will test the level of statistical significance at 95% of the findings. A true representation of the population will be obtained if the test falls within 5% level of significance.

CHAPTER FOUR: RESULTS

4.0 Introduction

This chapter presents the results of the study based on the research objectives. Regression analysis and correlation studies were used to analyze the panel data to answer the research objectives. The banks that were analyzed are 6 randomly selected commercial banks in the Nairobi Securities Exchange. These banks are: Kenya Commercial Bank, NIC Bank, Equity Bank, National Bank, CFC Bank and I&M Bank. The results are presented in the form of summary tables and graphic presentations.

4.1 Graphical Results

4.11 Standard Chartered Bank

The ROA, ROE and CAR for Standard Chartered was obtained as shown in table 4.1 below.

Table 4.1

Year	ROE	ROA	CAR
2006	0.260053	0.032517	0.125038
2007	0.317871	0.038079	0.119796
2008	0.282709	0.032830	0.116127
2009	0.340056	0.038236	0.112439
2010	0.264432	0.037663	0.142428
2011	0.282048	0.003550	0.012588
2012	0.262400	0.041307	0.157422
2013	0.255837	0.042029	0.164282
2014	0.256681	0.046905	0.182737
2015	0.153749	0.027108	0.176316
2016	0.107578	0.020419	0.189810

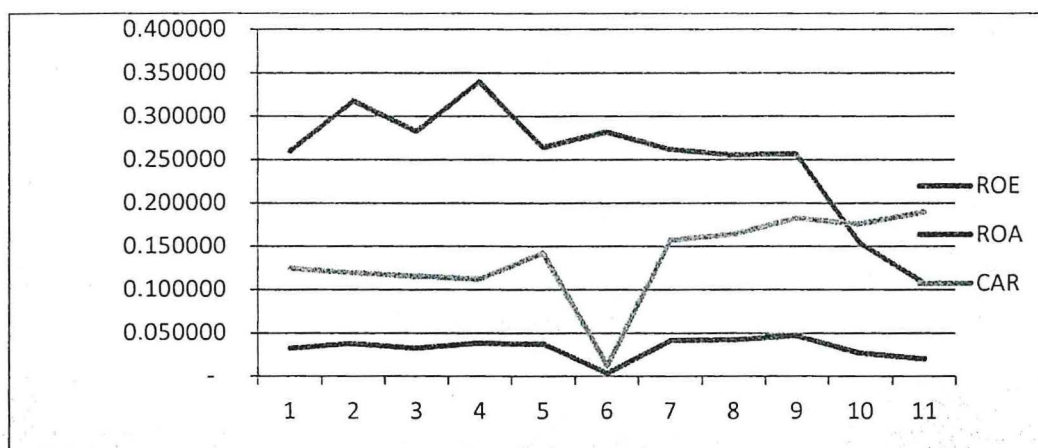


Figure 4.1

The capital adequacy affected both the ROE and ROA almost in the same manner. Where the CAR increased the ROE increased significantly as in period 4 in figure 4.1. A decline in the CAR however affected ROA more and on rising, the ROE shows lagged effects due to the lower levels of capital in the prior periods.

4.12 Kenya Commercial Bank

KCB yields the following results from its total assets, equity and net profit after tax.

Table 4.2

Year	ROE	ROA	CAR
2007	0.225267	0.024689	0.109601
2008	0.198734	0.021917	0.110281
2009	0.180941	0.020967	0.115877
2010	0.183440	0.028557	0.155675
2011	0.247516	0.033204	0.134148
2012	0.228789	0.033218	0.145189
2013	0.226366	0.036693	0.162095
2014	0.024445	0.003771	0.154248
2015	0.241504	0.035161	0.145591
2016	0.204580	0.033189	0.162230

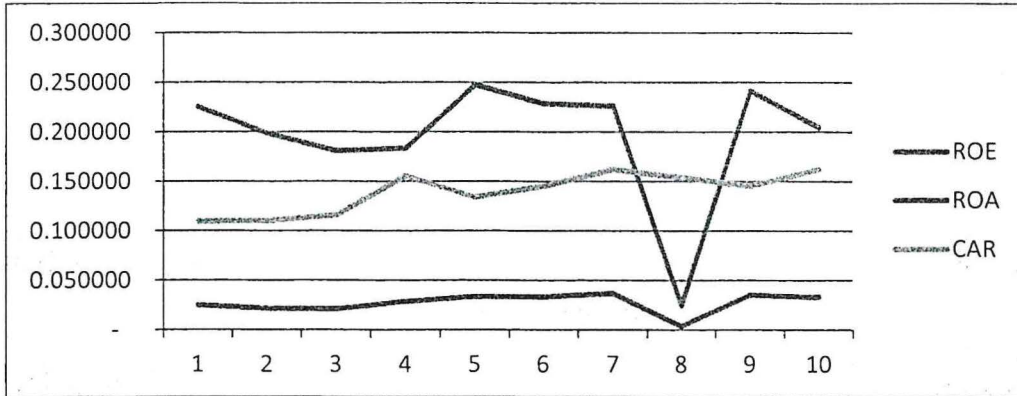


Figure 4.2

KCB maintained an almost consistent CAR for the 10 periods. A sharp increase in the CAR is observed between period 3 and 4 (2009) whereas the declining ROE starts to rise at the peak of CAR showing the role of capital adequacy as a buffer against losses during an economic downturn. A sharp decline for ROA and ROE is observed in period 8 possibly due to the low profits reported during the period.

4.13 NIC BANK

The following results are obtained for NIC Bank

Table 4.3

Year	ROE	ROA	CAR
2007	0.157393	0.023838	0.151457
2008	0.186440	0.024348	0.130593
2009	0.159846	0.022829	0.142820
2010	0.223137	0.031584	0.141547
2011	0.257260	0.034274	0.133229
2012	0.196155	0.028028	0.142887
2013	0.184263	0.026741	0.145122
2014	0.176298	0.028239	0.160177
2015	0.170238	0.027053	0.158914
2016	0.142704	0.025554	0.179072

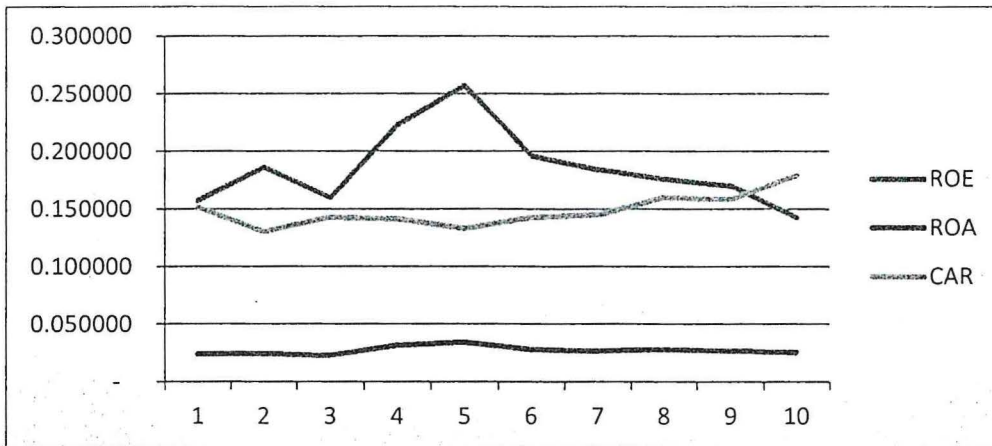


Figure 4.3

NIC Bank has a steadily rising CAR over the period with an almost constant ROA. The ROE however rises when the CAR decreases possibly due to use of capital in investments or for credit expansion. In period 9-10, a rise in CAR led to a fall in ROE.

4.14 I&M BANK

Table 4.4 below shows the results obtained for I&M bank. A graphical representation is shown in figure 4.4

Table 4.4

Year	ROE	ROA	CAR
2009	0.1852062	0.02539161	0.1370991
2010	0.2895522	0.04615935	0.1594164
2011	0.2289708	0.03213589	0.1403493
2012	0.2121724	0.03455039	0.1628411
2013	0.2270616	0.03523326	0.1551705
2014	0.2334249	0.03397721	0.1455595
2015	0.2249622	0.03660082	0.1626977
2016	0.2097769	0.03612962	0.1722288

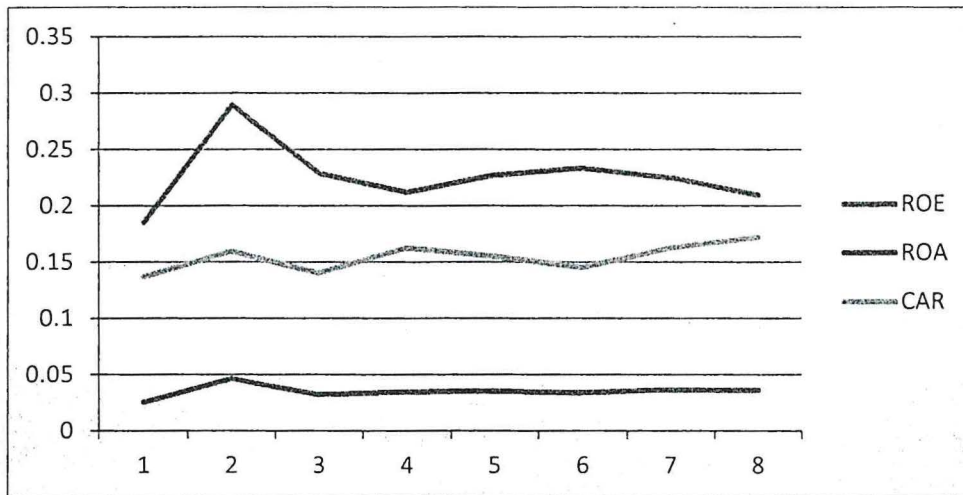


Figure 4.4

The results for I&M Bank are in tandem for the three variables. An increase in CAR is met by an increase in ROE and ROA. In period 2, the decline in CAR was also followed by a decline in ROE and ROA and thereafter the variables increased steadily.

4.15 NATIONAL BANK

On obtaining the total assets, total equity and net profit after tax for National Bank, the following results are obtained.

Table 4.5

Year	ROE	ROA	CAR
2007	0.225356	0.02702923	0.1199402
2008	0.1998455	0.02905702	0.1453974
2009	0.185004	0.02845972	0.153833
2010	0.3409868	0.03368366	0.0987829
2011	0.1479537	0.02251691	0.1521889
2012	0.0697895	0.01086671	0.155707
2013	0.0094885	0.00121876	0.1284459
2014	0.0712288	0.00707359	0.099308
2015	-0.104354	-	0.088118
		0.00919542	
2016	0.0145452	0.00140677	0.096717

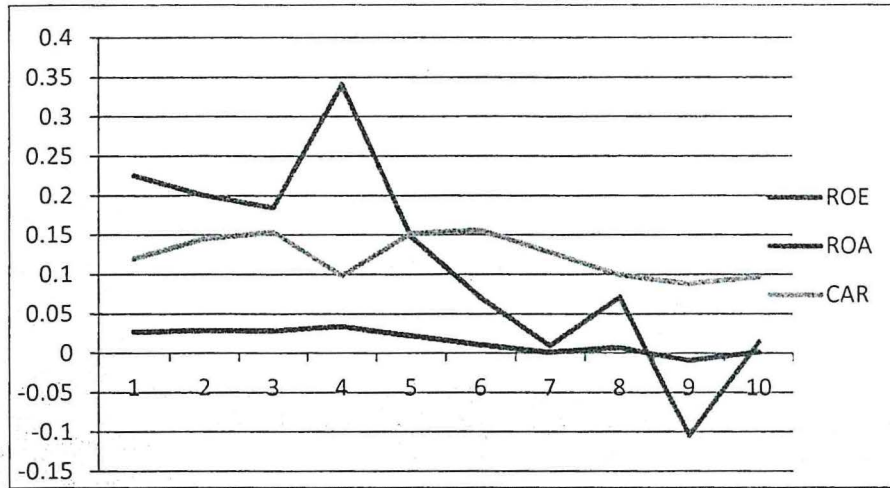


Figure 4.5

For National Bank, the ROE has a sharp peak during period 4 despite the low capital adequacy whereas the ROA rises by a small amount. With increased CAR, the ROA further declined as from 5-10 showing an inverse relationship that exists between the ROE and CAR.

4.16 EQUITY BANK

Table 4.6 and figure 4.6 below shows the summary findings obtained for Equity Bank.

Table 4.6

Year	ROE	ROA	CAR
2007	0.1267229	0.03557895	0.2807619
2008	0.2001393	0.04959971	0.2478259
2009	0.1848187	0.04199895	0.227244
2010	0.2621434	0.04986309	0.1902131
2011	0.2788752	0.05524731	0.1981076
2012	0.2577076	0.05095156	0.1977107
2013	0.2494102	0.05307362	0.2127965
2014	0.2689326	0.0497759	0.1850869
2015	0.2398711	0.04042269	0.1685184
2016	0.2018344	0.03492788	0.1730522

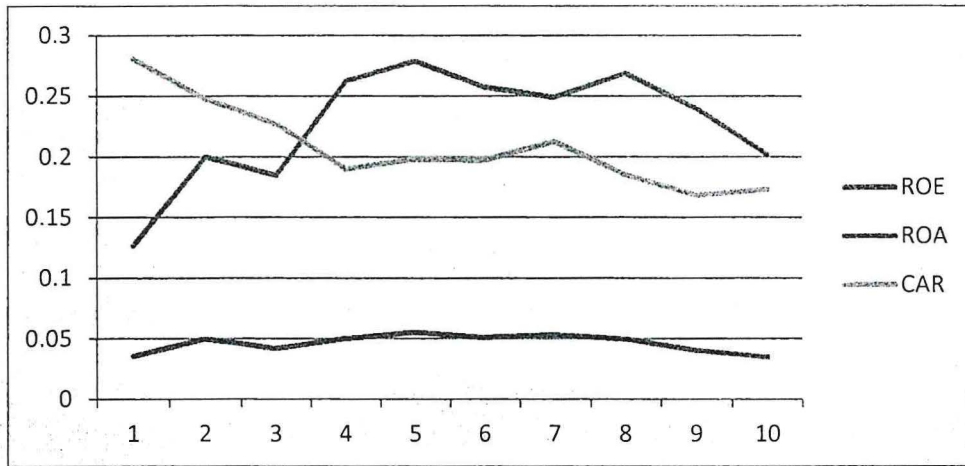


Figure 4.6

The results obtained for Equity Bank are also similar to those obtained from National Bank. A sharp decline in the CAR is met by a sharp rise in the ROE possibly showing the extension of more credit and consequently more profit. The ROA however remains constant over the period.

4.2 Regression Analysis

Table 4.7 below shows the results obtained after regressing the CAR and ROE for the different years on the different sample banks. The equation corresponds to the equation 1 in chapter 3.

Source	SS	df	MS	Number of obs	=	59
Model	.00028918	1	.00028918	F(1, 57)	=	0.04
Residual	.385372462	57	.00676092	Prob > F	=	0.8369
Total	.385661643	58	.006649339	R-squared	=	0.0007
				Adj R-squared	=	-0.0168
				Root MSE	=	.08222

ROE	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
CAR	.0558141	.2698748	0.21	0.837	-.4846009 .596229
_cons	.1922282	.042248	4.55	0.000	.107628 .2768284

On regression of the CAR with the ROA, the following results were obtained:

Source	SS	df	MS	Number of obs	=	59
-----+-----				F(1, 57)	=	33.43
Model	.00383763	1	.00383763	Prob > F	=	0.0000
Residual	.006542831	57	.000114787	R-squared	=	0.3697
-----+-----				Adj R-squared	=	0.3586
Total	.010380462	58	.000178973	Root MSE	=	.01071

ROA	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
-----+-----						
CAR	.2033251	.0351645	5.78	0.000	.1329093	.2737409
_cons	-.0003127	.0055049	-0.06	0.955	-.011336	.0107107
-----+-----						

Table 4.8

4.3 Correlation

Correlation coefficient measures the strength of a relationship of independent variable with a dependent variable. Table 4.9 below shows the correlation coefficients between CAR and ROE and ROA with CAR.

```

. correlate ROE CAR
(obs=59)

```

	1	ROE	CAR
ROE	1	1.0000	
CAR		0.0274	1.0000


```

. corr ROA CAR
(obs=59)

```

	1	ROA	CAR
ROA	1	1.0000	
CAR		0.6080	1.0000

The correlation coefficient between ROE and CAR is 0.0274 while that between ROA and CAR for the panel data used is 0.6080. Since there is no correlation coefficient that is greater than 0.8, no variable was dropped.

CHAPTER 5: DISCUSSION, RECOMMENDATIONS AND CONCLUSIONS

5.1. Introduction

This chapter presents discussions of the key findings of the study as well as limitations of the study, recommendations for further research and conclusions.

5.2 Discussion

Test of significance was carried out for all variables studied using the t-test at the 95% level of significance. The t-test was used as the sample of banks is less than 30.

From the observations;

Any p-value that is greater than 0.05 will be deemed to have a significant relationship with the dependent variable. The relationship is considered to be insignificant if the p-value is less than 0.05.

The standardized coefficient and the t-statistic indicate the strength of the relationship between the dependent and independent variables. The adjusted R square measures the degree of variability of the dependent variable due to the change in the independent variable.

From the regression results obtained on performing a regression between the CAR and the ROE shown in table 4.7, the Prob> F shows the p-value associated with the F-static. It is used to test the null hypothesis that all of the model coefficients are 0. From the results obtained, the p-value=0.8369 which is greater than 0.05 shows that the independent variable has a significant relationship with the dependent variable. As such, CAR has a significant positive relationship with ROE and can therefore be deemed to highly influence the amount of net income a bank obtains for every unit of equity capital.

R-squared shows the proportion of variance in the dependent variable that can be explained by the independent variable. It shows the overall strength association between the variables and not the extent to which a particular variable is associated with an independent one. Since our R-squared is 0.0007, the dependent variable is not dropped as it is lower than 0.8.

On regression of the CAR with the ROA, results in table 4.8 are obtained

Discussion

The p-value associated with the F-static is used to test the null hypothesis that all of the model coefficients are 0. From the results obtained, the p-value=0.000 which is less than 0.05 showing that the independent variable has an insignificant relationship with the dependent variable. As such, CAR has an insignificant relationship with ROA and can therefore be deemed not to influence the amount of income per total assets

R-squared shows the proportion of variance in the dependent variable that can be explained by the independent variable. It shows the overall strength association between the variables and not the extent to which a particular variable is associated with an independent one. Since our R-squared is 0.3697, the dependent variable is not dropped as it is lower than 0.8.

The column for ROA also shows the dependent variable at the top (ROA) and the explanatory variables below it. The constant or intercept for the equation is -0.003127. For every unit increase in CAR, a 0.2033251 increase in ROA is predicted.

Inserting equation with variables obtained.

$$Y = \alpha + \beta_1 X_1 + \varepsilon \dots \dots \dots \text{equation 2}$$

Where:

Y=Financial Performance as measured by ROA

α = a constant

β_1 = Coefficient of independent variable (capital adequacy ratio)

X1 = Capital Adequacy as measured by capital adequacy ratio

ε = Error Term

5.3 Link to Literature Review

From the above findings, a unit increase in CAR increases ROE by 0.0558141 and increases ROA by 0.2033251 which also shows a positive relationship between the amount of capital held and the

level of profits obtained. This is consistent with the Signaling theory that holds that banks hold capital levels to take opportunities when profitable investment opportunities that were not expected arise. Rather than borrowing from the public at high transaction costs in the event of occurrence of such opportunities, banks use their own capital theory to be able to take the advantage of gains without incurring high transaction costs. Further, the positive relationship also supports the bankruptcy theory (Berger, 1995) that higher amounts of equity capital are held during bankruptcy to facilitate payment of debt at lower rates charged. This is in order to outweigh the deadweight costs that are evident during bankruptcy.

Evidently, an increase in the capital adequacy ratio will increase return on equity and return on assets. This study supports the positive relationship that (Ojiambo, 2014) obtained on Kenya Commercial Bank, KCB and CFC Stanbic. Further the study supports the finding of (Kusa, 2013) who finds a strong positive relationship between the level of profits and capital adequacy. The same is obtained by (Fadzlan, 2012) who also obtains a positive relationship by analyzing Bangladesh commercial banks.

Consistent findings are obtained on regressing ROA and ROE with CAR because ROE is a product of ROA and the equity multiplier and thus a function of the other. ROE helps compare the extent of capital adequacy on financial performance of the banks independent on the asset base that the banks have.

The results are inconsistent with the works of (Gatete, 2015), (Kiragu, 2010) and (Ojiambo, 2014) who finds a negative relationship between capital (tier 1 and tier 11) and the level of profits of commercial banks. The findings that support negative relationships are contrary to the Signaling and Bankruptcy theory and can be argued by (Kusa, 2013) that banks with high levels of capital go for less risky assets as they fear putting such huge amounts of capital in jeopardy by investing in highly risky assets.

The findings of this study are however consistent with other preceding research by (Adoli, 2014), (Fadzlan, 2012) and (Onounga, 2014). Most of these findings of a positive relationship are supported by the argument that banks will hold high levels of capital if they expect profitable opportunities to arise and to avoid cases of deadweight costs and bankruptcy costs that arise when

there is no adequate capital during an economic downturn. As such the Bankruptcy Theory and Signaling Theory have been practically tested and are consistent with the findings.

5.4 Implication for the study

Regression for the panel data between capital adequacy and financial performance was done separately. First, ROA was regressed with capital adequacy ratio then ROA was regressed with the same variable to establish the relationship that capital levels have on the financial performance. Indeed, as (Eashkins, 2007) points out Return on assets is directly related to Return on assets. Positive coefficients are obtained when ROA and ROE are regressed against CAR showing this relation. Further, ROA and ROA for the 6 banks under study consistently decrease in the period 2007 to 2009. This could be attributed to the financial losses made after the post-election violence in the country during 2007/2008. The performance measures took an upward trajectory from 2009 showing signs of recovery. The CAR was also low during the earmarked year explaining the financial losses made since the amount of capital was low and thus could not buffer the commercial banks from unforeseen losses.

The extent that the CAR affects the ROE and ROA is obtained as a unit increase in CAR increases ROE by 0.0558141 and increases ROA by 0.2033251. This implies that banks should hold more capital to take advantage of the arising opportunities despite facing a tradeoff between investing the same capital in profitable project. Such a decision will support the Signaling and the Bankruptcy theory. As observed in the results, a preceding period that had a low CAR affected the ROE and ROA for the next period. This is as indicated by results from Standard Chartered Bank in table 4.1 and figure 4.1. for period 6. Despite the sharp increase of CAR from period 6, the ROE rises slowly. This implies that capital adequacy has a drastic impact on the ROE not just for the given period but also for the following period.

5.4 Limitations of this study

The study covered only commercial banks that are in the Nairobi Securities Exchange. Most tier 3 banks for instance were not included due to unavailability of the data as the banks are not publicly listed.

The period under study is not as long and therefore does not capture the lag effects fully. For instance, for Standard Chartered Bank, NIC and KCB the analysis back dates from 2007 while for I&M Bank starts from 2009.

Further, the double causality effect between the level of profits and capital is not considered. The level of profits is studied to be affected by the capital levels held. However, the level of capital could be affected by the profits in this case ROE and ROA. This is as brought forward by (Fuertes, 2012) showing that there is a possibility of one period's profitability affecting the next period's capital.

5.5 Recommendations for further studies

Further research could incorporate longer periods of study. This will be in order to show the lag effects of the variables and so as to cover the pre-Basel and post Basel periods, the analysis could be carried out from as early as 1970s or 1980s.

The double causality effect should also be considered while performing the analysis to establish whether the level of capital held is due to the amounts of profits (ROE and ROA) earlier registered.

To avoid biasness, further research should be based on other banks that are not necessarily publicly listed. This will be in a bid to establish whether the same relationship holds.

5.6 Conclusion

The main focus for this study was establishing the extent to which capital adequacy influences the Return on Assets and the Return on Equity. The extent that CAR influences the level of ROE and ROA was determined through regression of multi-panel data. The extent was established as for every unit increase in CAR, a 0.0558141 increase in ROE is predicted. Further, for every unit increase in CAR, a 0.2033251 increase in ROA is predicted. A positive relationship between CAR and ROE and between CAR and ROA was obtained through positive coefficients.

The results were consistent with the Signaling Theory that banks hold high levels of profits when they expect profitable opportunities in the future and with the Bankruptcy theory that capital acts as a buffer during an economic downturn hence contributes positively to the ROE and ROA.

These findings were consistent with those obtained by (Adoli, 2014), (Fadzlan, 2012) and (Onounga, 2014).

Evidence from the results suggests that financial performance was affected by the level of capital held by the banks. Based on the findings, it is therefore necessary that Kenyan banks hold adequate levels of capital to achieve high Return On Equity and Return On Assets.

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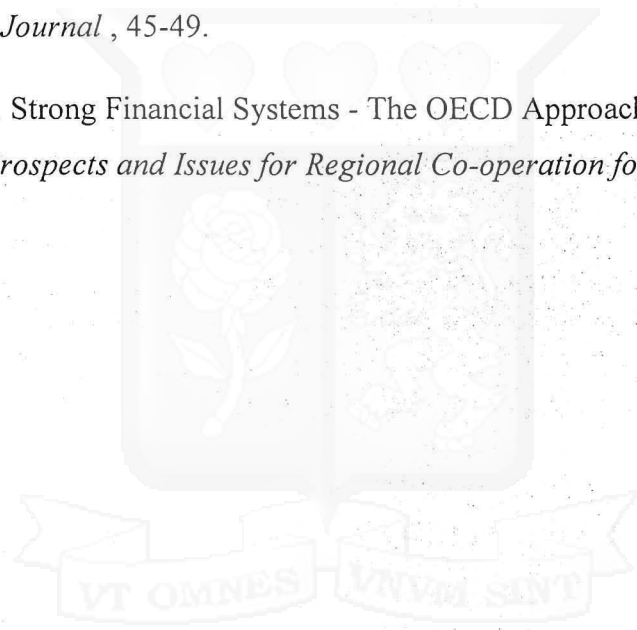
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APPENDICES

Appendix 1: Standard Chartered Bank.

Variables used for regression

Year	COMPANY	Net Income	Total assets	Owner's capital	ROE	ROA	CAR
2006	Stan chart	2,634,300	81,014,123	10,129,857	0.260053	0.032517	0.125038
2007	Stan chart	3,469,877	91,121,942	10,916,008	0.317871	0.038079	0.119796
2008	Stan chart	3,250,813	99,019,571	11,498,807	0.282709	0.032830	0.116127
2009	Stan chart	4,732,754	123,778,972	13,917,565	0.340056	0.038236	0.112439
2010	Stan chart	5,376,191	142,746,249	20,331,122	0.264432	0.037663	0.142428
2011	Stan chart	5,836,821	1,644,046,624	20,694,456	0.282048	0.003550	0.012588
2012	Stan chart	8,069,533	195,352,756	30,752,814	0.262400	0.041307	0.157422
2013	Stan chart	9,262,921	220,391,180	36,206,401	0.255837	0.042029	0.164282
2014	Stan chart	10,436,180	222,495,824	40,658,174	0.256681	0.046905	0.182737
2015	Stan chart	6,342,427	233,965,447	41,251,758	0.153749	0.027108	0.176316
2016	Stan chart	5,226,314	255,948,220	48,581,629	0.107578	0.020419	0.189810

Appendix 2: Kenya Commercial Bank.

Variables used for regression

Year	COMPANY	Net Income	Total assets	Owner's capital	ROE	ROA	CAR
2007	KCB	2974572	120479553	13204660	0.225267	0.024689	0.109601
2008	KCB	4190690	191211586	21086952	0.198734	0.021917	0.110281
2009	KCB	4083871	194777835	22570212	0.180941	0.020967	0.115877
2010	KCB	7177973	251356200	39129771	0.183440	0.028557	0.155675
2011	KCB	10981046	330716159	44365027	0.247516	0.033204	0.134148
2012	KCB	12203531	367379285	53339559	0.228789	0.033218	0.145189
2013	KCB	14341382	390851579	63354967	0.226366	0.036693	0.162095
2014	KCB	1848862	490338324	75633557	0.024445	0.003771	0.154248
2015	KCB	19623069	558094154	81253607	0.241504	0.035161	0.145591
2016	KCB	19755447	595239643	96565775	0.204580	0.033189	0.162230

Appendix 3: NIC Bank.

Variables used for regression

Year	COMPANY	Net Income	Total assets	Owner's capital	ROE	ROA	CAR
2007	NIC	745,687	31,281,018	4,737,733	0.157393	0.023838	0.151457
2008	NIC	1,037,681	42,619,119	5,565,750	0.186440	0.024348	0.130593
2009	NIC	1,085,718	47,558,241	6,792,254	0.159846	0.022829	0.142820
2010	NIC	1,863,918	59,013,922	8,353,229	0.223137	0.031584	0.141547
2011	NIC	2,707,137	78,984,005	10,522,953	0.257260	0.034274	0.133229
2012	NIC	3,036,794	108,348,593	15,481,622	0.196155	0.028028	0.142887
2013	NIC	3,237,301	121,062,739	17,568,906	0.184263	0.026741	0.145122
2014	NIC	4,116,674	145,780,505	23,350,713	0.176298	0.028239	0.160177

2015	NIC	4,485,125	165,788,268	26,346,142	0.170238	0.027053	0.158914
2016	NIC	4,330,396	169,458,985	30,345,364	0.142704	0.025554	0.179072

Appendix 4: I&M Bank.

Variables used for regression

Year	COMPANY	Net Income	Total assets	Owner's capital	ROE	ROA	CAR
2009	I&M	1,382,179	54,434,467	7,462,919	0.1852062	0.02539161	0.1370991
2010	I&M	4,010,424	86,882,153	13,850,437	0.2895522	0.04615935	0.1594164
2011	I&M	3,472,724	108,063,712	15,166,670	0.2289708	0.03213589	0.1403493
2012	I&M	4,119,558	119,233,345	19,416,090	0.2121724	0.03455039	0.1628411
2013	I&M	4,974,956	141,200,545	21,910,160	0.2270616	0.03523326	0.1551705
2014	I&M	5,234,548	154,060,579	22,424,978	0.2334249	0.03397721	0.1455595
2015	I&M	6,032,643	164,822,609	26,816,253	0.2249622	0.03660082	0.1626977
2016	I&M	6,581,281	182,157,482	31,372,761	0.2097769	0.03612962	0.1722288

Appendix 5: National Bank

Variables

Year	COMPANY	Net Income	Total assets	Owner's capital	ROE	ROA	CAR
2007	NATIONAL	1,119,396	41,414,272	4,967,235	0.225356	0.02702923	0.1199402
2008	NATIONAL	1,240,610	42,695,700	6,207,845	0.1998455	0.02905702	0.1453974
2009	NATIONAL	1,462,955	51,404,408	7,907,692	0.185004	0.02845972	0.153833
2010	NATIONAL	2,021,919	60,026,694	5,929,611	0.3409868	0.03368366	0.0987829

2011	NATIONAL	1,546,113	68,664,516	10,449,976	0.1479537	0.02251691	0.1521889
2012	NATIONAL	729,752	67,154,805	10,456,474	0.0697895	0.01086671	0.155707
2013	NATIONAL	112,803	92,555,717	11,888,399	0.0094885	0.00121876	0.1284459
2014	NATIONAL	870,702	123,091,996	12,224,023	0.0712288	0.00707359	0.099308
2015	NATIONAL	(1,153,477)	125,440,316	11,053,549	-0.104354	-	0.088118
2016	NATIONAL	162,190	115,292,392	11,150,739	0.0145452	0.00140677	0.096717

Appendix 6: Equity Bank

Variables obtained

2007	EQUITY	1,890,283	53,129,246	14,916,668	0.1267229	0.03557895	0.28076
2008	EQUITY	3,910,283	78,836,806	19,537,804	0.2001393	0.04959971	0.247825
2009	EQUITY	4,233,988	100,811,750	22,908,870	0.1848187	0.04199895	0.227244
2010	EQUITY	7,131,325	143,018,114	27,203,913	0.2621434	0.04986309	0.190213
2011	EQUITY	9,773,857	176,910,996	35,047,420	0.2788752	0.05524731	0.198107
2012	EQUITY	10,996,839	215,829,300	42,671,763	0.2577076	0.05095156	0.197710
2013	EQUITY	12,641,836	238,194,354	50,686,922	0.2494102	0.05307362	0.212796
2014	EQUITY	17,151,365	344,571,649	63,775,696	0.2689326	0.0497759	0.185086

2015	EQUITY	17,303,438	428,062,514	72,136,415	0.2398711	0.04042269	0.1685
2016	EQUITY	16,545,794	473,713,133	81,977,096	0.2018344	0.03492788	0.1730

