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ABSTRACT

The purpose of the study was to examine the effects of volatility of bank earnings on capital structure choice for commercial banks operating in Kenya. A correlational research design was used to measure the relationship between volatility of bank earnings and the capital structure choice. The study used secondary data over the period 2004-2013 from 39 commercial banks' annual financial reports filed with the Central Bank of Kenya. The data was analysed using Statistical Package for Social Sciences (SPSS) using multiple linear regression models to test the relationship between volatility of bank earnings and the capital structure choice (debt-equity ratio). The study found that volatility of earnings had significant effect on the capital structure choice and exhibited a negative and linear correlation with capital structure choice. The study concluded that Earnings volatility is costly as it affects a firm's investment policy by raising external capital. Firms with smoother earnings should be more highly valued and hence attract funding competitively. The study recommended that in order to mitigate volatility in earnings, the banks need to ring fence their customers from competitors like Fintechs, Saccos, MFIs, peer banks and those who are encroaching their business territories. Cross selling and upselling using technology platforms like customer relationship management (CRM) will further enable the banks increase their customers' wallet size, increase product uptake as well as sell new and substitute products.

Key Words: Volatility of Bank Earnings, Capital Structure

Page: - 311 -

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INTRODUCTION

Determining optimal capital structure is one of the fundamental policy decisions faced by financial managers. Since optimal debt ratio in the real market which is largely imperfect arguably influences firm's value, different firms determine capital structures at different levels to maximize their value. Several studies on capital structure theories for instance, (Mehran & Thakor, 2011) and (Ross & Jaffe, 2002) suggest that firms determine what is often referred to as a target debt ratio; which is based on various trade-off between the costs and benefits of debt versus equity. Firms in non-financial industries need capital mainly to support funding such as to buy property and to build or acquire production facilities and equipment to pursue new areas of business. While this is also true for banks, their main focus is somewhat different. By their very nature, banks attempt to manage multiple and seemingly opposing needs. Banks provide liquidity on demand to depositors through the current account and extend credit as well as liquidity to their borrowers through lines of credit (Kashyap, Rajan, & Stein, 1999). Owing to these fundamental roles, banks have always been concerned with both solvency and liquidity.

Earlier studies have made tremendous contributions to the theory of capital structure, but they are limited to developed financial system and restricted to non-banks. Less developed countries such as Kenya have received little attention in the literature. Octavia and Brown (2008) observe that capital structure of banks is still a relatively under-explored area in the banking literature and the special nature of the deposit contract, the degree of debt-equity ratio in banking and the regulatory constraints imposed on commercial banks have meant that banks (and financial institutions in general) have been excluded in previous empirical studies on standard capital structure choice.

Commercial banks in Kenya play a major role of contributing to economic growth of the country by mobilizing funds for investments. The banking sector in Kenya was liberalized in 1995 and exchange controls lifted. Commercial banks in Kenya have in the recent past been going through transformation to cope with the constantly changing business environment, increasing domestic and global competition, economic downturn, technological advancements, rapidly changing market trends and volatile financial markets. The banks in Kenya have also had to remain responsive to ongoing developments in both the domestic and international environment.

According to the Central Bank of Kenya Annual Report for 2013 changes in the banks' operating environment are driven by first; the entrenchment of devolution in Kenya where the banking sector is expected to revamp its infrastructure to meet the needs of the market both nationally and within the counties. Secondly, the advance in information and communication technology where continuing advances in and deployment of information and communication technology in the banking sector is impacting on the sector's operating efficiency and capacity. Thirdly, by the regional integration which is expected to impact the sector both strategically, legally and operationally as more institutions seek to expand their global footprint within the East African region and beyond. Central banks of the East African Community have also had to continue their efforts towards harmonization of their regulatory frameworks, aimed at strengthening the banking sector from a regulatory perspective. Lastly, the changes in commercial banks' businesses are driven by the large infrastructure projects; oil, gas and other minerals that have recently been discovered in Kenya and the region. These natural resources provide the banking sector with new opportunities for commercial long-term engagement towards gainful exploitation of the resources. In this regard,

commercial banks in Kenya have the opportunity to tap into these resources and this will have an impact on their capital structure choice.

For over fifty years there has been enormous debate regarding the capital structure of firms and the determination of an optimal capital structure after Modigliani and Miller's 1958 irrelevance theorem. Capital structure decision is one of the three financing decisions – investment, financing and dividend decisions that finance managers have to make. Capital structure of a firm determines the Weighted Average Cost of Capital (WACC). WACC is the minimum rate of return required on a firm's investments and used as the discount rate in determining the value of a firm. A firm can create value for its shareholders as long as earnings exceed the costs of investments (Damodaran, 2000).

The question of how firms choose their capital structure remains unanswered. Scholars argue that markets are imperfect and Modigliani and Miller's work has been the catalyst to numerous academic works thereafter to attempt to solve the puzzle of capital structure. A good deal of the effort of the financial decision making process is centred on the determination of the optimal capital structure with the aim of maximizing the value of a firm and minimizing the cost of capital. De Wet (2006) argues that firms make choices in terms of the capital structure that apparently maximize their value. The variables influencing this choice have generated a lot of academic debate. There are finance theories, for instance, Modigliani and Miller (1958) that argue that capital structure decision do not impact the value of the firm. This is so because the capital structure decision can be related to make up of the ownership structure, but not to the investment decision. The financing decision will determine the mix of debt and equity, the relative number of shareholders and debt holders, and the distribution of investment proceeds between interest, dividends and capital gains. Thus

how investments are financed should not have an impact on the investment decision itself and on the value of a firm.

Capital structure theories have to a large extent been derived from prior work on the capital structure of industrial firms. According to Diamond and Rajan (2000) commercial banks and their assets and functions are materially different from other industries. MacKay and Phillips (2005) and Miao (2005) find that a firm's debt-equity mix depends on its industry. Banks are profit-making institutions and managed with the aim of generating wealth for their shareholders. According to Diamond and Rajan (2001) banks play a crucial role in a country's economy; they are deposit-taking institutions and act as the custodians of the public's money. Banks provide loan finance to clients and trade in various types of assets. They are the transmission mechanism for monetary policy and providers of other specialized functions, such as trading in foreign currencies. This study examines the effect of volatility of bank earnings on the capital structure choice for commercial banks operating in Kenya and extends empirical work on the capital structure theory.

Statement of the Problem

Over the years, studies have been carried out to find out the variation in debt-equity ratios across firms, for instance; Diamond and Rajan (2000) and Allen, Carletti and Marquez (2009). The studies suggest that firms select capital structures depending on variables that determine the various costs and benefits associated with debt and equity financing with a view to maximizing their values. The aim of this study was to examine the effect of firm volatility of bank earnings on the capital structure choice for commercial banks operating in Kenya as a cushion during financial crises and extend empirical work on the capital structure theory. The variables that the theories of capital structure suggest may affect the firm's capital structure choice include; collateral value

of assets, size of a firm, earnings volatility and profitability and may be moderated by firm ownership (Harris & Raviv, 1991).

Objectives of the Study

The objective of this study was to examine the influence of volatility of bank earnings on capital structure choice for commercial banks operating in Kenya.

Hypothesis

To achieve the objectives of this study the following hypothesis was tested.

H_0: There is no relationship between volatility of bank earnings and capital structure choice for commercial banks operating in Kenya.

LITERATURE REVIEW

Capital structure theories explain how the mix of debt and equity in the firm's capital structure influences its value. It is the specific mix of debt and equity a firm uses to finance its operations. Since the seminal paper by Modigliani and Miller (1958) and their proposition that the value of a firm is independent of its debt-equity mix, several theories have been advanced and have kept the capital structure debate alive. Many of these theories have been empirically tested and to date there is little consensus on what factors for instance, specifically influences the choice of capital structure in commercial banks. Recent studies by Flannery and Rangan (2008) document how US banks' capital ratios varied in the last decade. Gropp and Haider (2009) find that the variables of bank capital structure are similar to those of non-financial firms and Mehran and Thakor (2011) document a positive relation between bank value and capital structure in the cross section. This study reviewed four broad categories of capital structure theories. The categorization was informed by the motivating forces that drive financial management decisions and include; traditional optimal capital

structure theories, information asymmetry theories, agency approach theories and the market timing theories.

Empirical Review

Earnings volatility arise either due to the inherent business risk in the operation of a firm or may be attributed to the inefficient managerial practices and denotes financial distress. Firms with high volatile earnings will have to pay high risk premiums to lenders. Myers (2001) finds that underinvestment problem increases with the volatility of the firm's cash flow. Earnings volatility is, thus, expected to be negatively correlated with debt-equity ratio. Both trade-off theory and the pecking order theory suggest a negative relationship between earnings volatility and debt-equity ratio. Firms with high earnings volatility carry a risk of the earnings level dropping below their debt servicing commitments thereby incurring a higher cost of financial distress. Such an eventuality may result in rearranging the funds at a high cost or facing bankruptcy risk. It can therefore be argued that, firms with highly volatile earnings should have lower debt capital.

Titman and Wessels (1988) suggest that a firm's optimal debt level is a decreasing function of the volatility of earnings. Accordingly, these firms tend to reduce their debt-equity ratio level to avoid the risk of bankruptcy. Trade-off theory predicts a negative relationship between debt-equity ratio and earnings volatility of a firm. The pecking order theory supports the same prediction.

Flannery and Rangan (2008) present good evidence against the equity cushion view. They show that bank earnings volatility is not positively related to the excess of book capital over required capital (the cushion), inconsistent with the view that the cushion is chosen to protect the bank against the risk of poor outcomes that would breach the regulatory capital requirement. Firms with asset types (e.g., intangible

assets or firm-specific assets) that are associated with high bankruptcy costs are all the more prone to be conservative in their debt-equity choices in response to the volatility of their earnings.

Byoun (2008) and Flannery and Rangan (2006) suggest existence of asymmetric information where corporate insiders may have private information regarding their own earnings volatility. In such a setting of asymmetric information about earnings volatility, there is a lemons problem in pricing debt claims and the firms are better off issuing equity securities. Issuing levered equity (with call option features) can be justified as a defensive measure or as a signal of low volatility. If the market believes that firms with a high volatility of earnings are also those with a large menu of risky projects that they can adopt after the external financing is in place, it would be important to commit not to do so by issuing levered equity or convertible debt to outsiders.

Green (1984) has shown, such mechanisms as a well-designed convertible, are optimal in that they reassure the market that the firm does not gain by adopting risk-shifting strategies with such securities outstanding. It can be argued that a firm would pre-commit not to risk shift by raising a larger component of their external finance as equity. The conventional wisdom that firms with high volatile earnings should borrow less is however not supported by all reported evidence. Ang and Peterson (1986) and Titman and Wessels (1988) find that the role of an effective tax rate on debt-equity ratio determination is not statistically significant in any country and argue that this observation may be caused by the lack of variation in the rate of corporate tax across firms. Any observed variation is likely to be a manifestation of the changes in the corporate tax rate over the sample period. Consistent with the prediction of the trade-off theory and the findings of Leary and Roberts (2005), firms with higher non-debt tax shields borrow less.

METHODOLOGY

This study used a correlational research design which is basically concerned with assessing relationships among variables. Correlation is a measure that indicates how one variable, factor or attribute varies in relation to another. The variation could be negative or positive. The target population for this study comprised of 43 commercial banks which was the total number of commercial banks operating in Kenya over the study period 2004-2013. The list kept by the Central Bank of Kenya of all licensed commercial banks operating in Kenya during the period 2004-2013 constituted the sampling frame for this study. To analyze the data, the study used quantitative analysis. Using SPSS, multiple correlations were worked out to find out the relationship between the dependent and independent variables under consideration. A multiple linear regression model was used to determine the relative importance of each explanatory variable in influencing the choice of capital structure for commercial banks operating in Kenya represented by debt-equity ratio. Volatility of bank earnings and its relation to capital structure choice can be traced to various corporate finance theories on departures from the Modigliani-Miller (1958) irrelevance proposition including; Harris and Raviv (1991) and Frank and Goyal (2009). The theories do not specify the functional forms describing how these variables relate to the indicators and the capital structure. The model used was developed by Joreskog (1977) and subsequently used in many other studies in different variants including; Amidu (2007), Bevan and Danbolt (2004), Huang and Song (2005) and Frank and Goyal (2007). The overall measurement model is as specified below;

$Y = \beta_0 + \beta_1X_1 + \varepsilon$

Where;   Y = Capital Structure Choice (CAPSTR)

X_1= Volatility of a bank's earnings (VBE), and

ε = Error term

FINDINGS

To determine the correlation between volatility of bank earnings and capital structure choice, the study generated the Pearson Correlation Coefficient (PCC) results as indicated in Table 1 below. The findings in this study indicated that there is a negative and significant 0.976 correlation between the volatility of a bank's earnings and capital structure choice. The strong and negative linear relationship between volatility of a bank's earnings and capital structure is significant given the p value equal to 0.003 was less than 0.05 confidence interval.

Table 1: Pearson Correlation Results on Volatility of Bank Earnings

	Volatility of Bank Earnings	Capital Structure
Volatility of Bank Earnings	1	
Capital Structure	0.976	1
Sig.	0.03	

To establish the relationship between volatility of bank earnings and capital structure choice, a linear regression analysis was ran generating a scatter plot diagram and the line of best fit as shown in Figure 1 below;
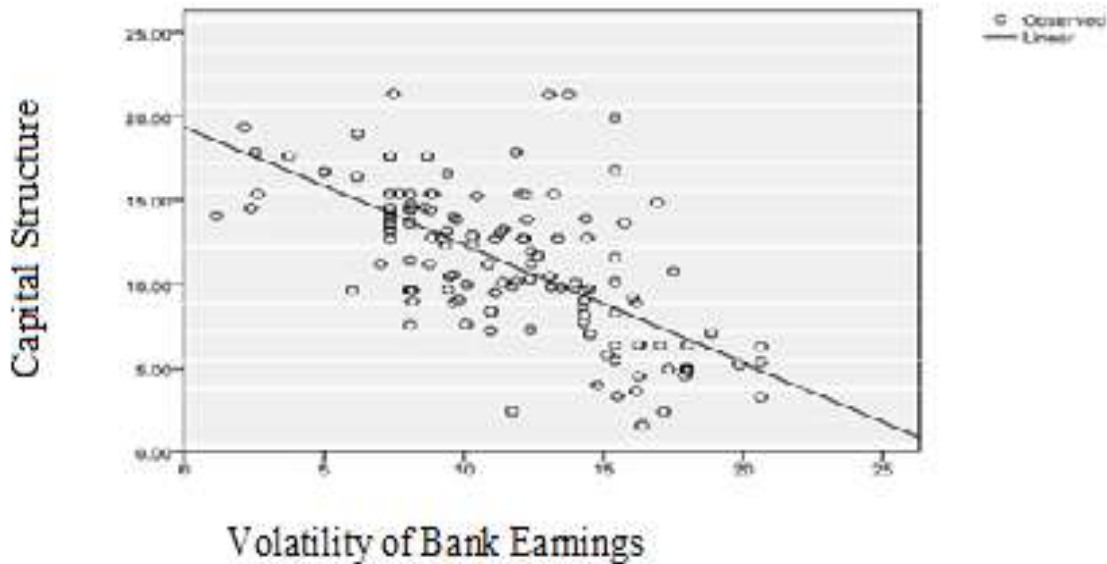

Figure 1: Scatter Plots of Volatility of Bank Earnings and Capital Structure

The results from this study as indicated by the scatter plots in Figure 1 above depicted a linear negative relationship between the volatility of bank earnings and capital structure choice among commercial banks operating in Kenya. A line of best fit on the scatter plots was an indicator of the predictive accuracy of the model on volatility of bank earnings against its capital structure choice. From Figure 1 above, it was observed that there is negative and linear correlation between volatility of bank earnings and capital structure choice.

The regression model is as presented below.

$CAPSTR = \beta_0 + \beta_1 VBE + \varepsilon$

Where;

CAPSTR = Capital Structure

β_0= Constant term associated with the regression model,

β_1= coefficient of independent variable, volatility of bank earnings

VBE= Volatility of Bank Earnings, independent variable

ε= Error term associated with the regression model

The relationship between volatility of bank earnings and the capital structure choice was examined by testing the research hypothesis which stated that:

H_0: There is no relationship between volatility of bank earnings and capital structure choice for commercial banks operating in Kenya.

Using linear regression analysis, the study proceeded to determine the relationship between volatility of bank earnings and capital structure choice. A model summary Table 2 results comprised of the coefficient of correlation and the coefficient of determination, R^2. From the model summary table the coefficient of determination, R^2 for the model was 0.953 while the R value was 0.976. These values indicated that volatility of bank earnings greatly explained the variations in capital structure choice in commercial banks operating in Kenya with 4.7% of the variations being explained by other variables not included in the model.

Table 2: Model Summary

Indicator	Value
R	0.976
R Square	0.953
Sig.	0.000

The study further examined the effect of volatility of bank earnings on capital structure choice for commercial banks operating in Kenya by generating ANOVA output results as shown in Table 3 below to determine whether the regression model significantly predicted the outcome variable. The ANOVA results generated as indicated by F statistics equal to 2.735 was statistically significant because the p-value of .000 was less than 0.05 confidence interval. This implied that, statistically, the model applied significantly in predicting the capital structure choice for commercial banks operating in Kenya.

Table 3: ANOVA Statistics

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	27.367	1	27.367	2.735	.000[b]
1	Residual	12.524	5	2.505		
	Total	39.891	6			

The study further generated Beta coefficients results as represented in Table 4 which showed that the relationship between capital structure and volatility in bank earnings is statistically significant given the p value equal to 0.000 is less than 0.05 confidence interval . The negative coefficient in volatility of bank earnings implies that the volatility in bank earnings and the capital structure choice in commercial banks operating in Kenya move in different direction and that a 1 unit increase in volatility in bank earnings leads to 5.635 units decrease in debt-equity ratio (capital structure choice).

Table 4: Coefficients of Volatility of Bank Earnings

Variable	B	Std. Error	T	Sig.
Constant	3.235	1.265	2.557	0.000

| Volatility in Banks earnings | -5.635 | 1.897 | -2.907 | 0.000 |

Figure 2 below showed a histogram of standardized residuals. A visual examination of the histogram suggests a positive skewness of the standardized residuals. As indicated by the statistics at the legend, the residuals had a standard deviation of 1 and a mean of zero as of a standard normal distribution implying the model yields a normal distribution giving normally distributed values. The pattern shown below indicates no problems with the assumption that the residuals are normally distributed at each level of Y and constant in variance across levels of Y and hence the assumptions underlying the model used in this study have not been violated.
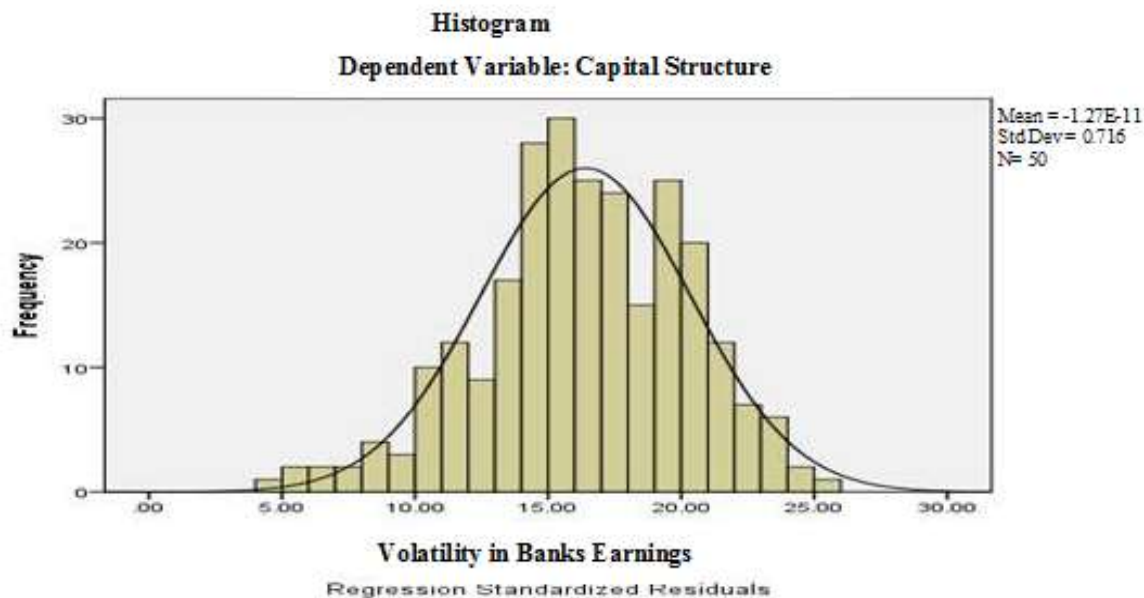

Figure 2: Histogram of Volatility in Bank Earnings and Capital Structure

The study further evaluated the study model based on the results presented in Table 5 after establishing that there existed a relationship between volatility of bank earnings and the capital structure choice. An R^2 = 0.953 implies that the model explains 95.3 % of the variations of capital structure of commercial banks operating in Kenya. The fitted model is summarized as below;

CAPSTR = 3.235 - 5.635 VBE

The results from the research findings demonstrated that volatility of bank earnings influences the variations of capital structure choice for commercial banks operating in Kenya hence we fail to accept the research hypothesis that there is no relationship between volatility of bank earnings and capital structure choice for commercial banks operating in Kenya and conclude that volatility in bank earnings has a significant relationship with capital structure choice in commercial banks operating in Kenya.

The findings of this study were corroborated by a number of previous studies on capital structure choice in firms among them; Myers (2001) who found earnings volatility to be negatively correlated with debt-equity ratio given that underinvestment problem increases with the volatility of the firm's cash flow. The findings are in line with both trade-off theory and the pecking order theory which posited that a negative relationship exists between earnings

Page: 318

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volatility and debt-equity ratio where firms with high earnings volatility carry a risk and therefore should have lower debt capital. As in the case of this study, Titman and Wessels (1988) found a negative relationship between risk and leverage. The study suggested that firms experiencing high volatility in earnings would tend to have low debt-equity ratios to avoid the risk of bankruptcy.

Flannery and Rangan (2008) concurred with the findings in this study by showing that bank earnings volatility is not positively related to the excess of book capital over required capital (the cushion), inconsistent with the view that the cushion is chosen to protect the bank against the risk of poor outcomes that would breach the regulatory capital requirement. Byoun (2008) and Flannery and Rangan (2006) suggest existence of asymmetric information where corporate insiders may have private information regarding their own earnings volatility. In such a setting of asymmetric information about earnings volatility, there is a lemons problem in pricing debt claims and the firms are better off issuing equity securities. Issuing levered equity (with call option features) can be justified as a defensive measure or as a signal of low volatility. If the market believes that firms with a high volatility of earnings are also those with a large menu of risky projects that they can adopt after the external financing is in place, it would be important to commit not to do so by issuing levered equity or convertible debt to outsiders. Green (1984) has shown, such mechanisms as a well-designed convertible, are optimal in that they reassure the market that the firm does not gain by adopting risk-shifting strategies with such securities outstanding. It can be argued that the firm would pre-commit not to risk shift by raising a larger component of their external finance as equity.

The findings of this study were however, not supported by all reported evidence. Ang and Peterson (1986) and Titman and Wessels (1988) find that the role of an effective tax rate on debt-equity ratio

determination is not statistically significant in any country and argue that this observation may be caused by the lack of variation in the rate of corporate tax across firms. Any observed variation is likely to be a manifestation of the changes in the corporate tax rate over the sample period. Consistent with the prediction of the trade-off theory and the findings of Leary and Roberts (2005), firms with higher non-debt tax shields borrow less.

CONCLUSION AND RECOMMENDATIONS

To determine the effect of volatility of bank earnings on capital structure choice for commercial banks operating in Kenya, the secondary data established a negative and significant correlation given that the R value equal to 0.976 while R square value was 0.953. The findings implied that volatility of bank earnings explained 95.3% variations of capital structure choice among commercial banks operating in Kenya. The negative Beta coefficient of the volatility of bank earnings equal to -5.365 implied that volatility of bank earnings and capital structure move in the opposite direction and that 1 unit increase in volatility of bank earnings leads to 5.365 units decrease in capital structure choice. The regression model fitted in this study to establish the relationship between volatility of bank earnings and capital structure choice, statistically, predicted the capital structure composition significantly well. The study hence failed to accept the null hypothesis; H_0: There is no relationship between volatility of bank earnings and its capital structure choice for commercial banks operating in Kenya at 95% confidence level, meaning there was significant but negative relationship between volatility of bank earnings and capital structure choice.

Volatility of earnings has been found to have a negative relationship with capital structure choice in that shareholders are better off if a firm maintains smooth cash flows which greatly enable the

commercial bank to reduce reliance on costly external finance. Earnings volatility is costly as it affects a firm's investment policy by raising external capital. Firms with smoother earnings should be more highly valued and hence attract funding competitively. Commercial banks with high earnings volatility are susceptible to negative earnings surprises keeping away competitively priced funding and therefore increasing firm's borrowing costs. Firms with greater earnings smoothing have a lower cost of capital even after accounting for cash flow volatility. Highly volatile firms are also unable to attract institutional investors given the risk of loss of value to their investors. To mitigate volatility in earnings, the banks need to ring fence their customers from competitors like Fintechs, Saccos, MFIs, peer banks and those who are encroaching their business territories. Cross selling and upselling using technology platforms like customer relationship management (CRM) will further enable the banks increase their customers' wallet size, increase product uptake as well as sell new and substitute products.

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Page: 320

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Page: 321

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