

Factors Influencing the Choice of Capital Structure for Banks Listed on the Nairobi Securities Exchange

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Abstract

This study extended the empirical work on the capital structure theories by investigating the factors influencing the choice of capital structure for banks listed on the Nairobi Securities Exchange over the period 2007-2011. Using a linear regression model, the study found that debt ratio was positively related to collateral value of assets. Banks with high value of collateral assets had higher borrowing capacities and hence high debt-equity ratio. The study also found that small banks tended to use less of debt capital than large banks suggesting that direct bankruptcy costs constitute a larger proportion of a firm's value as that value decreases, hence small firms will be relatively in greater danger when in debt than large banks. The study returned a large negative coefficient estimate for the growth indicating that banks characterized as having high growth rates tended to have low debt ratios. Banks are largely regulated and this may have influenced the findings.

Keywords

Capital Structure, Collateral Value of Assets, Earnings Volatility, Profitability.

I. Introduction

The primary objective of a firm is to maximize shareholders wealth. A firm can achieve this objective by making proper decisions on three key areas of financial management namely, financing, investment and distribution of earnings. Corporate managers therefore, have to make decisions on how identified profitable investments are to be financed. Firms can use internal or external sources to finance their investments. Internal sources include retained earnings while external sources basically refer to new borrowings or the issue of stock. Since it is often not feasible for firms to finance their activities purely from internal sources as these do not allow the transfer of finance over time, they often choose external sources for higher flexibility in terms of obtaining financial resources at different times and for various purposes. Thus the financing decision involves— the fraction of external finance to be borrowed and the fraction to be raised in the form of new equity.

Bank capital has been much in the news during the 2007-2009 global financial crisis. The crisis started in the United States of America and spread across the world severely damaging the economies of many countries and reached a new level in September 2008 as a number of prominent US-based financial institutions collapsed. The crisis spread beyond the US borders and shocks were felt across the world. Whereas the cause of the crisis was attributed to the US housing market [1], the effective response by banks and their resilience depended on the adequacy and quality (debt-equity mix) of their capital. When examining the roots of the crisis, [2] find that banks' active management of their capital structures in relation to internal value at risk, rather than regulatory constraints, is a critical factor.

Commercial banks operate in a world of stiff competition and cost effective mix of capital is an important decision for them to survive

this competition and sustain their operations into the future. In the wake of the recent global financial crisis commercial banks have been placed under the spotlight and their capital adequacy levels and capital structure have come into question. The choice of alternative funding sources and the resultant mix of debt to equity are of utmost importance to bank management. Bank management is constantly in search of an optimal capital structure that maximizes the value of the firm and decreases its risk profile. [3] observe that there are many theoretical studies and empirical research addressing capital structure choices but there is not yet a fully supported and commonly accepted theory; and the debate on the significance of firm specific variables on the capital structure choice is still unsettled.

There are many finance theories that argue that capital structure decision should not impact on the value of the firm. This is because this 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 numbers 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. Thus, financing and investment decisions are independent of each other and the value of the firm is determined by the latter. Thus, as financing decisions have no affect on the value of a firm, it can be argued that they are irrelevant and should be the residue of the more important investment decisions. In practice, however, firm managers and investors devote much time and resources to making and analyzing financing decisions and capital structure. Indeed, when market imperfections such as taxation, transaction costs, asymmetric information and agency conflicts are introduced, devoting time and resources to financing decisions no longer appears a futile pursuit. In this regard, theoretical and empirical researches have aspired to clarify how financing decisions and capital structure choices impact on the value of firms that operate in imperfect markets. To date no consensus has been reached.

A. Problem Statement

Banks operating in Kenya, specifically those quoted on the Nairobi Securities Exchange have in the recent past been going through tremendous expansion both within and beyond the borders. According to the Central Bank of Kenya Annual Report of 2011, this phenomenon has been occasioned by their desire to extend their market frontiers in search of profits and growth. The banks have had to source for huge sums of finances to fund their expansion programs including new product developments. According to the same report there has also been a significant move by these banks to modernize their information technology systems in order to meet the ever changing and dynamic consumer needs. This too meant that the banks have had to raise substantial amounts of finances to fund these modernization programs.

A review of the sources of financing chosen by these banks over the period 2007 to 2011 indicate a mixture of preferred source

comprising of debt and equity. The study attempts to document the factors that influence the choice of capital among the banks listed on the Nairobi Securities Exchange. In recent years, a number of theories have been proposed to explain the variation in debt-equity ratios across firms. The theories suggest that firms select capital structures depending on attributes that determine the various costs and benefits associated with debt and equity financing.

The purpose of this study was therefore to identify factors that influence the choice of capital structure among the banks listed on the Nairobi Securities Exchange and extend empirical work on capital structure theory. The attributes that different theories of capital structure suggest may affect the firm's debt-equity choice include; collateral value of assets, growth, size of a firm, earnings volatility, and profitability.

B. Objectives of the Study

The general objective of this study was to examine the influence of firm specific variables on capital structure choice for commercial banks operating in Kenya.

The specific objectives of the study were;

- To examine the effect of collateral value of bank assets on capital structure choice for commercial banks operating in Kenya.
- To find out the effect of a bank's size on capital structure choice for commercial banks operating in Kenya.
- To determine the effect of volatility of earnings on capital structure choice for commercial banks operating in Kenya.
- To establish the effect of profitability on capital structure choice for commercial banks operating in Kenya.

1. Hypotheses

- There is no relationship between collateral value of bank assets and its capital structure choice for commercial banks operating in Kenya.
- There is no relationship between size of a bank and its capital structure choice for commercial banks operating in Kenya.
- There is no relationship between volatility of bank's earnings and its capital structure choice for commercial banks operating in Kenya.
- There is no relationship between bank's profitability and its capital structure choice for commercial banks operating in Kenya.

2. Justification of the Study

The issue of capital structure is an important strategic financing decision that commercial banks have to make. Bank regulators will find the study quite useful in formulating policies aimed at maintaining adequate capital and healthy capital structure mix for the purpose of guaranteeing stability in the banking sector and the economy at large and more so to enhance resilience during periods of economic turbulence. The proper application of capital structure theory and compliance with regulations will decrease a bank's risk profile and in turn result in a more stable monetary system and economy. Investors will be able to make their investment decisions from a more informed position by analyzing the capital structure of a bank. The study will provoke bank managers' thoughts whenever they are making capital structure decisions and provide useful insights that will aid in their decision making process and their attempts to maximize their banks' value and performance. The study extends empirical work on capital structure theories and

aims to contribute to the existing body of knowledge on the topic of capital structure for commercial banks. Scholars may wish to use this study as a basis to carry out further studies on capital structure.

3. Scope of the study

The study focused on banks quoted at the Nairobi Securities Exchange with an emphasis on factors that has influenced their choice of capital structure over the five-year period 2007-2011. The population of study was more restrictive as it comprised of all banks listed on the Nairobi Securities Exchange which were only ten (10) in total. More so the banks are highly regulated and the study may have yielded different results if the population contained both regulated and unregulated study units.

II. Literature Review

Capital structure theories are concerned with explaining how the mix of debt and equity in the firm's capital structure influences its market value. Since the seminal paper by [4] and their proposition that the value of the firm is independent of its debt-equity mix, several theories have emerged and have kept the capital structure debate alive. The paper considers three of the broad categories of these theories that are relevant to this study. The categorization has been done on the basis of the motivating forces that drive financial management decisions and they include; traditional optimal capital structure theories, information asymmetry theories and agency approach theories.

The traditional optimal capital structure theory also referred to as the trade off theory proposes that the optimal level of debt is where the marginal benefit of a source of finance is equal to its marginal cost. The focus of this theory is on debt and its proponents aver that the aim of a value maximizing manager should be to equate the costs and benefits at the marginal and operate at the optimal level. Two theories abound; the tax benefits of debt versus bankruptcy/distress costs and trading off the agency costs of debt versus agency costs of equity. [5] argue that since interest payments are deducted in arriving at the profit figure on which tax is charged, these payments actually reduce the corporate tax liability, the use of debt engenders tax shield benefit. They also find that use of debt increases the magnitude and possibility of distress costs in the event of bankruptcy. [6-9] suggest that optimal capital structure can be obtained as the tax advantage is traded off against bankruptcy costs.

Under the information asymmetry theories, firm managers (insiders) are assumed to possess private information on the characteristics of the firm's streams of returns or the investment opportunities. This information is not available to investors and outsiders, but they try to infer by rational expectations. Proponents of these theories argue that capital structure is designed to mitigate inefficiencies in the firm's investment decisions that are caused by information asymmetry and choice of capital structure signals to outsiders the information of the insiders. There are two approaches under this theory; first capital structure is designed to mitigate inefficiencies in the firm's investment decisions that are carried out by information asymmetry. Secondly, the choice of capital structure signals to outsiders the information of the insiders.

[10] show that if investors are less informed than current firm's insiders about the value of a firm's assets then equity may be mispriced by the market. If equity is to be issued to finance new

investments this under pricing may be so severe that the Net Present Value (NPV) of the new project resulting in a net loss to the existing shareholders. Thus such projects may be rejected even if their NPVs are positive. They suggest that this under-investment problem can be avoided if the firm finances new investments using a security that is safe from market undervaluation.

Internally generated funds involve no undervaluation and would be preferred. If outside finance is necessary, debt will be preferred to equity. [11] refers to this as the pecking order theory of financing; that is, capital structure will be driven by the firm's desire to finance new investments, first internally, then with low-risk debt, then finally with equity as the last resort. Proponents of the signaling theory claim that a firm's capital structure signals to the outsiders the information of the insiders. [12] and [13] suggest that managers know the true distribution of firm's returns that investors do not. Firms use capital structure to signal their quality and future prospects and higher quality firms have higher total value and issue more debt. [14] shows that stocks prices rise on average when a firm offers to exchange debt for equity. He ascribes this to the firm's willingness to exchange debt for equity signaling that the firm's debt capacity having increased and therefore, a debt for equity exchange would be good news.

Under the agency approach theories, [15] argue that when a firm has free cash flows, that is, internal sources of funds, they tend to squander it by consuming large amount of perquisites and by making sub-optimal investment decisions. When debt is used a commitment is entered into to pay out regular cash flows. This reduces the amount of cash available and thus makes managers more disciplined and force them to work efficiently for the interest of shareholders. [16] propose that debt in the capital structure generate information valuable in controlling agency behaviour. Particularly it is noted that for self-interest reasons, managers are always reluctant to liquidate the firm or to provide information that could lead to liquidation. This is the case even when liquidation is the best course of action from investors' point of view.

A. Empirical Review

Most capital structure theories posit that firms which possess assets that be used as collateral have the opportunity to issue cheaper and secure debts and should consequently have more debts in their capital structure. [10] suggest that firms may find it advantageous to sell secured debt. Their model demonstrates that there may be costs associated with issuing securities about which the firm's managers have better information than outside shareholders. Issuing debt secured by property with known values avoids these costs. For this reason, firms with assets that can be used as collateral may be expected to issue more debt to take advantage of this opportunity. [17] suggests that, by selling secured debt, firms increase the value of their equity by expropriating wealth from their existing unsecured creditors. [18] argue that owners of a firm with low collateral value of assets find it harder to monitor managers' perquisites consumption. They suggest that high debt levels reduce the tendency of managers to consume excessive perquisites because of the threat of bankruptcy. Bondholders are inclined to monitor such firms thereby engendering greater benefits in terms of disciplining managers in their perquisite consumption. According to [19] and [20] stockholders of highly leveraged firms tend to invest sub optimally to expropriate wealth from the firm's bondholders. [6] says that there is no easier way for a company to escape the burden of debt than to pay all its assets in form of

a dividend and leave bondholders holding onto an empty shell. If the debt can be collateralized, the borrower is restricted to use the funds for a specified project and wealth expropriation is minimized.

[20] suggests that equity-controlled firms have a tendency to invest sub optimally in order to expropriate wealth from the firm's bondholders. The opportunity for expropriation is greater in industries with more growth opportunities that require investment because managers have more discretion in their decisions. Myers noted that this agency problem can be mitigated if the firm issues short-term rather than long-term debt. This suggests that short-term debt ratios might actually be positively related to growth rates if growing firms substitute short-term financing for long-term financing. [19], [21], and [22] argue that the agency costs will be reduced if firms issue convertible debt. This suggests that convertible debt ratios may be positively related to growth opportunities. It is therefore posited that expected future growth should be inversely related to long-term debt capital. [23] show that leverage ratios are negatively related to Research and Development expenditure. Growth opportunities are capital assets that add value to a firm but cannot be collateralized. For this reason, it has been argued that future growth opportunities should be inversely related to long-term debt capital.

Studies by [24] and [25], suggest that direct bankruptcy costs constitute a larger proportion of a firm's value as that value decreases, hence small firms will be relatively in greater danger when in debt than large firms. It is also the case that relatively large firms tend to be more diversified and less prone to bankruptcy. These arguments suggest that large firms should be more highly leveraged. The cost of issuing debt and equity securities can also be said to be related to firm size. According to [26] small firms pay much more than large firms to issue new equity and also somewhat more to issue long-term debt. This suggests that large firms may be more leveraged than small firms and may prefer to borrow short term (through bank loans) rather than issue long-term debt because of the lower fixed costs associated with this alternative.

Many scholars have suggested that a firm's optimal debt level is a decreasing function of the volatility of earnings e.g. [30] suggest that firms with more volatile earnings growth may experience more situations in which cash flows are too low for debt service. [31] also observe that firms with a high degree of business risk have less capacity to sustain financial risks and thus use less debt. Firms experiencing high volatility in earnings would tend to have low debt-equity ratios. The more likely a firm is exposed to distress costs, the greater their incentive to reduce their level of debt within its capital structure. One firm variable that affects this exposure is the firm's operating risk; in that the more volatile the firm's earnings stream is, the greater the chance of the firm defaulting and being exposed to such costs. Studies by [27] suggest that profitability is significantly related to risk. This supports Myers pecking order theory that profitable firms will tend to use less of external finances. Their study suggests strong negative relationship between debt financing and profitability. [20] argues that firms prefer raising capital, first from retained earnings, second from debt, and third from issuing new equity. He suggests that this behaviour may be due to the costs of issuing new equity. These can be the costs that arise because of asymmetric information, or they can be mere transaction costs. In either case, the past

profitability of a firm, and hence the amount of earnings available to be retained, would arguably be an important determinant of its current capital structure.

III. Research Methodology

The study followed 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. In 1888 Galton invented the use of the regression line also known as the prediction line [28]. In this study all the 10 commercial banks quoted on the Nairobi Securities Exchange were considered. All the 10 banks were in operation throughout the period of study.

The secondary data used in this study were obtained from the annual financial statements of the 10 quoted commercial banks over the period 2007 to 2011. Variable averages were calculated over this five year period. Averaging over the five years reduces the measurement error due to random year-to-year fluctuations in the variables. The data was captured using excel spread sheet. The data was edited, coded and cleaned. The data was then analyzed using Statistical Package for Social Sciences (SPSS) version 20. A simple linear regression model was used to determine the relative importance of each explanatory variable in influencing the choice of capital represented by debt-equity ratio.

The study documented a number of attributes and their indicators that may in theory affect a firm's choice of capital. The theories do not however specify the functional forms describing how the attributes relate to the indicators and the debt-equity ratios. The model requires that these relations be linear. The model used was developed by [29]. It can be conveniently thought of as a factor analytic model consisting of two parts: a measurement model and a structural model that are estimated simultaneously. In the measurement model, unobservable firm-specific attributes are measured by relating them to observable variables, e.g., accounting data. In the structural model, measured debt-equity ratios are specified as functions of the attributes defined in the measurement model. The measurement model was specified as follows;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + e$$

Where; Y = Debt-Equity Ratio (D/E Ratio)

X_1 = Collateral value of a bank assets,

X_2 = Growth of a bank,

X_3 = Size of a bank,

X_4 = Volatility of a bank's earnings, and

X_5 = Profitability of a bank.

e = Error term

The above equation states that, although the firm-specific attributes that supposedly determine debt-equity ratios cannot be observed, a number of other variables denoted as indicators, are observable. The debt-equity ratio (dependent variable) can then be expressed as a linear function of one or more of the unobservable attributes and a random measurement error. The independent variables were measured using the following indicators as proxies;

1. The ratio of inventory plus gross plant and equipment to total assets (IGPITA) were used as measure for collateral value

of assets in a bank.

2. Indicator for growth was taken as capital expenditures over total assets (CEITA).
3. Natural logarithm of sales (LnS) was used as a measure for size of a firm.
4. The standard deviation of the percentage change in operating income (SIGOI) was used as a measure of the earnings volatility of a bank, and
5. Ratios of operating income over total assets (OITA) were used as indicators of profitability.

IV. Data Analysis and Findings

Variables were analyzed over the period 2007 to 2011. The source of all data were the financial statements filed with the Central Bank of Kenya for all banks quoted at the Nairobi Securities Exchange as presented on Table 1 below.

Table 1: Summary Data

	Variables					
	D/E RATIO	IGPITA	CEITA	LnS	SIGOI	OITA
BBK	0.147	0.022	0.010	5.117	12.700	0.180
CFC	0.264	0.166	0.005	4.529	63.530	0.026
COOP	0.111	0.048	0.078	4.858	7.779	0.122
DTB	0.264	0.017	0.005	4.568	14.585	0.106
EQUITY	0.307	0.047	0.008	4.894	32.557	0.141
HFCK	0.520	0.027	0.002	3.961	70.190	0.067
KCB	0.062	0.027	0.007	5.067	8.602	0.126
NBK	0.037	0.037	0.006	4.496	24.905	0.107
NIC	0.076	0.076	0.003	4.418	9.058	0.082
STANCHART	0.031	0.031	0.006	4.758	3.079	0.098

Source: Central Bank of Kenya

The parameters of the model were estimated by fitting a linear regression model using Statistical Package for Social Sciences (SPSS) version 20. The estimates of the parameters of the measurement model are presented in Tables II to V.

The model can be stated as follows;

$$D/E \text{ Ratio} = 0.169 + 0.258X_1 - 1.131X_2 - 0.041X_3 + 0.007X_4 + 0.547X_5$$

Where; D/E Ratio = Debt-Equity Ratio

X_1 = Collateral value of a bank assets,

X_2 = Growth of a bank,

X_3 = Size of a bank,

X_4 = Volatility of a bank's earnings, and

X_5 = Profitability of a bank.

The estimates are generally in accordance with my priori ideas about how well the indicator variables measure the unobserved attributes. The direction and the magnitude, as well as the statistical significance, of the estimates suggest that these indicators capture the concepts that were considered as determinants of capital choice.

The coefficient of +0.258 for collateral value of assets (X_1) indicates that debt ratio is positively related to collateralizable assets of a firm. The coefficient of -0.041 for size of a bank (X_3) indicates that small banks tend to use less of debt capital compared to large banks. Volatility of a bank's earnings (X_4) with a coefficient of +0.007 indicate that banks with volatile earnings tended to borrow

less. The coefficient of +0.547 for profitability (X_5) indicate that banks making good profits tended to have high debt ratios. The large negative coefficient estimate for the growth (X_2) of a bank indicates that banks characterized as having high growth rates tended to have low debt ratios.

Table 2: Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	IGPITA ^b	.	Enter
2	CEITA, LnS, SIGOI, OITA ^b	.	Enter

a. Dependent Variable: D/E RATIO

b. All requested variables entered.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.073 ^a	.005	-.119	.165029
2	.888 ^b	.789	.525	.107517

a. Predictors: (Constant), IGPITA

b. Predictors: (Constant), IGPITA, CEITA, LnS, SIGOI, OITA

Table 4: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.169	.081		2.087	.070
	IGPITA	.258	1.244	.073	.207	.841
2	(Constant)	.202	.919		.220	.837
	IGPITA	-1.131	1.676	-.321	-.675	.537
	CEITA	.546	1.661	.080	.329	.759
	LnS	-.041	.241	-.091	-.171	.873
	SIGOI	.007	.002	1.016	2.839	.047
	OITA	.547	2.320	.147	.236	.825

a. Dependent Variable: D/E RATIO

Table 5: Excluded Variables

Model	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics	
					Tolerance	
1	CEITA	-.193b	-.523	.617	-.194	.999
	LnS	-.560b	-1.753	.123	-.552	.966
	SIGOI	.999b	4.951	.002	.882	.775
	OITA	-.481b	-.987	.356	-.350	.525

a. Dependent Variable: D/E RATIO

b. Predictors in the Model: (Constant), IGPITA

V. Conclusions and Recommendations

The study used a linear regression technique for estimating the impact of unobservable attributes on the choice of capital structure for banks quoted at the Nairobi Securities Exchange. While the results are not conclusive, they serve to document some empirical findings that are consistent with existing theories. In particular, the study found that debt levels were positively related to the size of collateral assets, banks with volatile earnings tended to

borrow less, small banks tended to use less of debt capital and banks making good profits tended to have high debt ratios. The results indicate that debt ratio is positively related to collateralizable assets of a firm. Firms with high value of collateral assets have higher borrowing capacities and hence have high debt-equity ratio. This is consistent with [10] who suggest that firms may find it advantageous to sell secured debt. The results also indicate that small banks tended to use less of debt capital than large banks. This is consistent with studies by [24] and [25] that suggest that direct bankruptcy costs constitute a larger proportion of a firm's value as that value decreases, hence small firms will be relatively in greater danger when in debt than large firms. The study also found that banks with volatile earnings tended to borrow less. This is consistent with suggestion in many finance theories that a firm's optimal debt level is a decreasing function of the volatility of earnings.

The results did not support the studies by [19], [21] and [22] who argue that the agency costs will be reduced if firms issue convertible debt suggesting that convertible debt ratios may be positively related to growth opportunities. On the contrary the results of the study returned a large negative coefficient estimate for the growth indicating that banks characterized as having high growth rates tended to have low debt ratios. This in our view may be attributed to the fact that commercial banks are highly regulated and this may have put some restrictions on the use of debt in carrying out expansion programs. Based on the results of the study the null hypotheses have been rejected and a conclusion made that there is relationship between collateral value of bank assets, growth of a bank, size of a bank, volatility of bank's earnings and profitability and its debt-equity ratio.

It remains an open question whether the measurement model used in this study did persuasively capture the relevant aspects of the attributes suggested by the capital structure theories discussed herein. One could argue that the predicted effects were not uncovered because the indicators used in this study and the small size of the population studied did not adequately reflect the nature of the attributes suggested by theories. It is recommended that if stronger linkages between observable indicator variables and the relevant attributes can be developed, then the method suggested in this study can be used to carry out further studies to test more precisely the validity of theories of optimal capital structure.

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