

EFFECT OF FIRM CHARACTERISTICS ON CAPITAL STRUCTURE OF MANUFACTURING FIRMS IN NAIROBI COUNTY, KENYA

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Abstract

The manufacturing sector in Kenya contributes significantly to the economic growth. Therefore, it is important to evaluate factors that determine the firms' capital structure. The aim of this research was to establish the effect of firm characteristics on capital structure of manufacturing firms in Nairobi County, Kenya. Specifically, the study sought to determine the effect of firm size, liquidity, firm growth, non-debt tax shield and profitability on the capital structure of manufacturing firms in Nairobi County, Kenya. The study was built on three theories: Resource-Based Theory, Pecking Order Theory, and Agency Theory. Descriptive research design was employed and the study population was 364 manufacturing firms in Nairobi County. Fisher formula was used to generate a sample of 106 firms, which were selected using simple random sampling technique. Secondary data was collected using data collection sheet for a period of 10 years from 2009 to 2018. Data was extracted from audited annual financial records of the manufacturing firms stored in the Kenya Association of Manufacturers website. The collected data was analyzed quantitatively by use of descriptive statistics, correlation and regression analyses with the aid of Statistical Package for Social Sciences (SPSS) version 20. The findings indicated that individually, firm characteristics had a significant effect on capital structure. In addition, a combination of firm characteristics resulted to a significant effect on capital structure except for liquidity. The research concluded that firm size best explains capital structure, followed by growth, non-debt tax shield, profitability and lastly liquidity. This study will provide a clear guideline on how manufacturing firms balance between debt and equity financing.

Key words: Capital structure, Firm size, Growth, Liquidity, Non debt tax shield, Profitability

Introduction

The manufacturing industry has been the instrument of growth to most developed countries like United States (US) and China (Brown & Eichholtz, 2009). In Africa developing countries for example Kenya, the manufacturing industry has also been identified as the potential to turn the economies with negative growth to become vibrant ones. Capital structure is a substantial issue to a firm, especially to manufacturing firms (Yongsheng Chen 2011). The main reason why capital structure decisions are significantly vital is that it helps minimize the firm's Weighted Average Cost of Capital (WACC) by adjusting the return rate of debt.

Manufacturing firms that are quoted on the securities exchange have more access to funds from the public hence their borrowing ability increases their influence which in turn influences the capital structure proportions of debt and equity (Faulkender & Smith, 2016). Firms without access to the public debt markets are more restricted in their ability to borrow and therefore have lower leverage (Faulkender & Smith, 2016). Manufacturing firms' capital structure invested in assets determines the financial position of the firm in terms of liquidity. More liquid assets should be financed by debt more often because banks and public debt markets incur lower costs from financing these debts this in turn means that higher asset liquidity increases the amount of capital the companies can borrow (Faulkender & Smith, 2016).

In Africa, the impact of firm characteristic on manufacturing firm's value is a function of the balance of power within a firm (Abor, 2015). In a situation where debt holders have more power, a negative influence would be obtained. The reverse is however the case where shareholders have more power. The use of high levels of debt in the capital structure leads to a decrease or increase in the return on shareholders' capital (return on owner's equity). Abor (2015) carried out a study on the relationship between total debt and total assets and profitability measured as return on equity. Abor reported a significantly positive relationship between total debt and total assets and profitability. Chandrakumarmangalam and Govindasamy (2010) did a comparative study on profitability and how shareholder's wealth is maximized and found that leverage is positively related to profitability and shareholders wealth is maximized when firms are able to employ more debt .

In Kenya, firm characteristic have a significant effect on capital structure on manufacturing companies (Nunes, Serrasqueiro & Sequeira, 2013). It is paramount to understand the effects of certain firm characteristics or capital structure on its profitability or returns on investment, returns on assets or returns on equity. Hall, Hutchinson and Michaelas (2012) did a study on the relationship between the exploiting shareholders' value and the value of the business using a cross-sectional study and found out that that the objective for most manufacturing firms in Kenya is to exploit shareholders' value as well as the value of the business as a whole. To achieve the value of the firm, manufacturing firms need to determine the firm characteristics and the factors affecting each and its capital structure by taking their internal and external environment into consideration (Nunes, Serrasqueiro & Sequeira, 2013).

Capital structures vary from nation to nation and from manufacturing firm to manufacturing firm; the debt equity choice even differs between firms within the same manufacturing industry. According to Hall, Hutchinson and Michaelas (2012), the differences in capital structure from one nation to another could be due to differences in the factors of capital structure that operate at the company level, rather than real differences between nations. This implies that each firm should concentrate on their own unique characteristics when making capital structure decisions. Today in Kenya, more and more manufacturing firms tend to issue equity or debts to finance when they need to expand their firm size or reinvest to gain more profits. This kind of capital structure adjustment will have effects on the firm's value. Manufacturing industries in Kenya have different proportions of capital structure and this has an impact on their financial firm's profitability. The manufacturing industry is a wide industry dealing with the changing/transformation of raw materials through a process aimed at finished goods for sale. This study dealt with the large manufacturing firms which according to the Kenya Statistical Abstract (2004) are firms with more than fifty employees.

Research Objectives / Hypothesis

Objective of the Study

The main objective of the study was to determine the effect of firm characteristics on capital structure of manufacturing firms in Nairobi County, Kenya.

Specific Objectives

- i. To determine the effect of firm size on capital structure of manufacturing firms in Nairobi County, Kenya
- ii. To determine the effect of liquidity on the capital structure of manufacturing firms in Nairobi County, Kenya
- iii. To determine the effect of growth on the capital structure of manufacturing firms in Nairobi County, Kenya
- iv. To determine the effect of non-debt tax shield on the capital structure of manufacturing firms in Nairobi County, Kenya
- v. To determine the effect of profitability on the capital structure of manufacturing firms in Nairobi County, Kenya
- vi. To determine the combined effect of firm characteristics on capital structure of manufacturing firms in Nairobi County, Kenya.

Research Hypotheses

To achieve the objective, the study tested the following hypothesis:

- i. **Ho1:** Firm size has no significant effect on capital structure of manufacturing firms in Nairobi County, Kenya
- ii. **Ho2:** Liquidity has no significant effect on capital structure of manufacturing firms in Nairobi County, Kenya
- iii. **Ho3:** Firm growth has no significant effect on capital structure of manufacturing firms in Nairobi County, Kenya
- iv. **Ho4:** Non-debt tax shield has no significant effect on capital structure of manufacturing firms in Nairobi County, Kenya
- v. **Ho5:** Profitability has no significant effect on capital structure of manufacturing firms in Nairobi County, Kenya
- vi. **Ho6:** Firm characteristics have no significant effect on capital structure of manufacturing firms in Nairobi County, Kenya

Operationalization of Study Variables

Variable/Objective	Definition	Measurements
Capital Structure	It is the way a firm finances its activities through debt and equity	-Debt/equity ratio
Firm Size	Business unit of a firm through ownership and management.	- total assets =value of assets – loans tied to the assets(liabilities)
Firm Liquidity	Ability of a debtor to pay the debts as when they fall due	-Current ratio (Current assets/current liabilities)
Firm Growth	Increasing sales, assets, net profits and increasing profits percentage	(Final Total Assets-Initial Total Assets)/Initial Total Assets
Non-debt Tax shield	Tax shield is a reduction in taxable income for an individual or corporation achieved through claiming allowable deductions such as mortgage interest, medical expenses, charitable donations, amortization and depreciation.	- Depreciation divided by Total Assets
Firm Profitability	The ability for a firm to generate revenue in excess of its expenses	-Return on assets (Net Income/Total Assets) Net income= profit after tax
Government Regulations	This refers to rules set by the government that manufacturing firms are expected to comply with.	-Dummy variable (1: Compliance 0: Non-compliance)

Methodology

This study adopted a descriptive research design. The population of this study comprised of 364 manufacturing firms in Nairobi County according to Kenya Association of Manufacturers (KAM, 2018). Nairobi was considered the best area to carry out the study because it had the highest number of manufacturing firms in Kenya. It was therefore considered to be a good representation of all the manufacturing firms in Kenya. The sample size was therefore 106 manufacturing firms picked using Fisher *et al*, (2003) out of the total population of 364 firms in Nairobi County.

$$n = \frac{z^2 p(1 - p)}{d^2}$$

Where;

n = sample size

z = the standard normal deviate value for the level of confidence, for instance 95% level of confidence =1.96.

d = margin of error or level of precision at 0.08 for CI at 92%

p = proportion to be estimated, Israel (2009) recommends that if one doesn't know the value of p then you should assume $p=0.5$

Therefore, sample size is arrived at as follows:

$$n = \frac{(1.96^2)(0.5)(1 - 0.5)}{(0.08)^2}$$
$$n = 150$$

Since the population was less 10,000, the sample size was further adjusted as follows:

$$n_0 = n / (1 + ((n - 1) / N))$$

$$n_0 = 150 / (1 + ((150 - 1) / 364))$$

$$n_0 = 106 \text{ Fisher } et al, (2003)$$

Simple random sampling technique was used to sample the manufacturing firms in Nairobi County under study. Simple random sampling was used since population members have an equal chance of being selected hence giving an accurate representation. Secondary data from financial year 2008/2009 to 2017/2018 for the selected manufacturing firms was used. The data was also extracted from KAM website. Gathered data was entered in check-in tables that contain all the variables under study data reliability and validity were ensured by collecting information and data from official sources such as annual audited accounts and corporate websites.

Data was then analyzed quantitatively by the use of descriptive statistics, correlation analysis and regression analysis. Capital structure of the manufacturing firms is the dependent variable while the independent variables are firm characteristics which included firm size, firm liquidity, firm growth, Non-debt tax shield and profitability. The findings obtained from the analysis were presented using tables.

The study conducted simple regression on the specific objectives and a multiple regression on the main objective of the study. The main objective was to determine the effect of firm characteristics (firm size, liquidity, age, firm growth, non-debt tax and profitability) on Capital structure of manufacturing firms in Nairobi County, Kenya.

The first objective of the study was to determine the effect of firm size on capital structure of manufacturing firms in Nairobi County, Kenya .The simple linear regression model for Firm Size was specified as;

$$Y = \alpha + \beta_1 X_1 + \epsilon \dots\dots\dots 3.1$$

Where: Y= Capital structure

α = Constant Term

β_i = Beta coefficients

X_1 = Firm Size

ϵ = standard errors

The second objective of the study was to determine the effect of firm liquidity on capital structure of manufacturing firms in Nairobi County, Kenya .The simple linear regression model for Firm Liquidity was specified as;

$$Y = \alpha + \beta_1 X_2 + \epsilon \dots\dots\dots 3.2$$

Where: Y= Capital structure

α = Constant Term

β_i = Beta coefficients

X_2 = Firm Liquidity

ϵ = standard errors

The third objective of the study was to determine the effect of firm growth on capital structure of manufacturing firms in Nairobi County, Kenya .The simple linear regression model for Firm Growth was specified as;

$$Y = \alpha + \beta_1 X_3 + \epsilon \dots\dots\dots 3.3$$

Where: Y= Capital structure

α = Constant Term

β_i = Beta coefficients

X_3 = Firm Growth

ϵ = standard errors

The fourth objective of the study was to determine the effect of Non-debt tax shield on capital structure of manufacturing firms in Nairobi County, Kenya .The simple linear regression model for Non-debt tax shield was specified as;

$$Y = \alpha + \beta_1 X_4 + \epsilon \dots\dots\dots 3.4$$

Where: Y= Capital structure

α = Constant Term

β_i = Beta coefficients

X_4 = Non-debt tax shield

ϵ = standard errors

The fifth objective of the study was to determine the effect of profitability on capital structure of manufacturing firms in Nairobi County, Kenya .The simple linear regression model for Profitability was specified as;

$$Y = \alpha + \beta_1 X_5 + \epsilon \dots\dots\dots 3.5$$

Where: Y= Capital structure

α = Constant Term

β_i = Beta coefficients

X_4 = Profitability

ϵ = standard errors

The fifth and last objective of the study was to determine the combined effect of firm characteristics on capital structure of manufacturing firms in Nairobi County, Kenya .The multiple regression model used is as shown below;

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \epsilon \dots\dots\dots 3.6$$

Where

Y= Capital Structure

α = Constant Term

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$, = Beta coefficients

X_1 = Firm Size

X₂= Firm Liquidity

X₃= Firm Growth

X₄= Non-debt Tax Shield

X₅= Firm Profitability

ε= standard errors

Results and Discussion

The main objective of the study was to determine the effect of firm characteristics on capital structure of manufacturing firms in Nairobi County. The data analysis is conducted in line with the study objectives

Descriptive Statistics Results

This section provides descriptive summary results for the study variables. Specifically, the study summarizes the mean, standard deviation, min and max values of each variable in each year.

Table 1: Descriptive Statistics

Variables	Descriptive	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Overall
Capital Structure	Mean	0.805	0.804	0.802	0.801	0.799	0.799	0.798	0.796	0.794	0.793	0.799
	Std. Deviation	0.434	0.434	0.434	0.434	0.434	0.434	0.434	0.434	0.434	0.434	0.432
Firm Size	Mean	9.308	9.316	9.300	9.286	9.298	9.294	9.279	9.282	9.284	9.278	9.293
	Std. Deviation	0.605	0.603	0.609	0.626	0.609	0.628	0.621	0.616	0.610	0.614	0.612
Liquidity	Mean	1.12	1.127	1.231	1.231	1.186	1.182	1.163	1.162	1.152	1.155	1.171
	Std. Deviation	0.910	0.911	1.501	1.501	1.216	1.217	1.180	1.181	1.131	1.130	1.198
Growth	Mean	2.796	2.798	2.796	2.793	2.799	2.799	2.795	2.797	2.801	2.798	2.797
	Std. Deviation	0.183	0.182	0.184	0.188	0.183	0.187	0.186	0.183	0.180	0.184	0.183
Non-debt tax shield	Mean	0.928	0.929	0.929	0.928	0.928	0.929	0.929	0.928	0.928	0.929	0.929
	Std. Deviation	0.061	0.062	0.060	0.063	0.061	0.061	0.060	0.061	0.060	0.061	0.061
Profitability	Mean	0.508	0.508	0.541	0.540	0.632	0.633	0.675	0.679	0.679	0.683	0.608
	Std. Deviation	3.274	3.274	3.518	3.518	4.040	4.040	4.334	4.334	4.334	4.334	3.908

Table 2: Descriptive Summary

Variable	Obs	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis
Capital Structure	1,060	0.79918	0.432	0.08	1.54	0.005	-1.223
Firm size	1,060	9.293	0.612	7.92837	10.1741	-0.401	-1.048
Liquidity	1,060	1.171	1.198	0	14	6.728	55.127
Growth	1,060	2.797	0.183	2.37851	3.05221	-0.414	-1.066
Non debt tax shield	1,060	0.929	0.061	0.79284	1.01741	-0.378	-1.08
Profitability	1,060	0.608	3.908	-0.1185	35.4036	7.359	53.893

The results reveal that the mean of capital structure for all the sampled manufacturing firms was 0.79918 throughout the measurement period (2009-2018). This means that manufacturing firms in Nairobi County have been relying on equity than debt. Further, the average mean for firm size was 9.28474, liquidity was 1.171, growth was 2.78542, non-debt tax shield was 0.92847, and profitability was 0.62841.

Table 3: Correlation Matrix

		Capital Structure	Firm size	Liquidit y	Growth	Non-debt tax shield	Profitabi lity
Capital Structure	Pearson Correlation	1					
	Sig. (2-tailed)						
Firm size	Pearson Correlation	.710**	1				
	Sig. (2-tailed)	0.000					
Liquidity	Pearson Correlation	.173**	.147**	1			
	Sig. (2-tailed)	0.002	0				
Growth	Pearson Correlation	-.709**	-.651**	-.214**	1		
	Sig. (2-tailed)	0.000	0	0			
Non-debt tax shield	Pearson Correlation	-.486**	-.354**	-.220**	.778**	1	
	Sig. (2-tailed)	0.000	0	0	0		
Profitabili ty	Pearson Correlation	-.256**	-.082**	-0.021	-.069*	-.079*	1
	Sig. (2-tailed)	0.001	0.007	0.495	0.025	0.01	

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

The results revealed that firm size and capital structure had a positive and significant correlation ($r=0.710$, $p=0.000$). This implied that increase in firm size is associated with increase in equity and debt of manufacturing firms. Findings also indicated that liquidity and capital structure had a positive and significant correlation ($r=0.173$, $p=0.002$). This implied that increase in liquidity is associated with increase in capital structure of manufacturing firms.

Further, results depicted that growth and capital structure had a negative and significant correlation ($r=-0.709$, $p=0.000$). This implied that increase in growth is associated with decrease in capital structure of manufacturing firms. In addition, results showed that non-debt tax shield and capital structure had a negative and significant correlation ($r=-0.486$, $p=0.000$).

This implied that increase in non-debt tax shield is associated with decrease in capital structure of manufacturing firms. Finally, results indicated that profitability and capital structure had a negative and significant correlation ($r=-0.256$, $p=0.001$). This implied that increase in profitability is associated with decrease in capital structure of manufacturing firms.

Regression Analysis

Effect of Firm Size on Capital Structure

The research sought to determine the effect of firm size on capital structure of manufacturing firms in Nairobi County, Kenya. Model summary, ANOVA and regression coefficient results are presented in Table 4, 5 and 6 respectively.

Table 4: Model Summary; Firm Size and Capital Structure

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.710 ^a	.504	.503	.3046242

a Predictors: (Constant), Firm Size

Table 5: ANOVA; Firm Size and Capital Structure

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	99.747	1	99.747	1074.908	.000 ^b
	Residual	98.178	1058	.093		
	Total	197.925	1059			

a Dependent Variable: Capital Structure

b Predictors: (Constant), Firm Size

Table 6: Regression Coefficients; Firm Size and Capital Structure

Model		Unstandardized Coefficients			
		B	Std. Error	t	Sig.
1	(Constant)	-3.864	.143	-27.109	.000
	Firm Size	.502	.015	32.786	.000

a Dependent Variable: Capital Structure

B- beta value

$$Y = -3.864 + 0.502 X_1$$

Where Y is capital structure and X_1 is firm size

The results from Table 4 showed an R^2 of 0.504. This means that firm size explains 50.4% of changes in the capital structure of manufacturing firms in Nairobi County, Kenya. The findings also imply that there are other factors that influence capital structure, albeit not included in this model.

The analysis of variance results from Table 5 indicated that the model linking firm size to capital structure was statistically significant. This was supported by F statistic of 1074.908 and p value of 0.000, which was less than the critical p value of 0.05. The results indicate that firm size was a good predictor of capital structure.

The coefficient results from Table 6 revealed that firm size had a positive and significant effect on capital structure of manufacturing firms in Nairobi County, Kenya ($\beta=0.502$, $p=0.000$). This means that a one unit increase in firm size increases capital structure by 0.502 units.

Following the regression results in Table 6; the null hypothesis (H01) that firm size has no significant effect on capital structure of manufacturing firms in Nairobi County, Kenya, was rejected since the P value $=0.000 < 0.05$. Therefore, the alternative hypothesis which states that, firm size has a significant effect on capital structure of manufacturing firms in Nairobi County, Kenya was accepted.

The study findings were consistent with that of Michaelas, Chittenden & Poutziouris (1999) who also found a positive relationship between size and the debt maturity structure of companies. However, the findings are contrary to the pecking order theory of the capital structure that predicts a negative relationship between leverage and size, with larger firms exhibiting increasing preference for equity relative to debt.

Effect of Liquidity on Capital Structure

The research sought to determine the effect of liquidity on the capital structure of manufacturing firms in Nairobi County, Kenya. Model summary, ANOVA and regression coefficient results are presented in Table 7, 8 and 9 respectively.

Table 7: Model Summary; Liquidity and Capital Structure

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.173 ^a	.030	.029	.4259669

a Predictors: (Constant), Liquidity

Table 8: ANOVA; Liquidity and Capital Structure

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.953	1	5.953	32.810	.001 ^b
	Residual	191.972	1058	.181		
	Total	197.925	1059			

a Dependent Variable: Capital Structure

b Predictors: (Constant), Liquidity

Table 9: Regression Coefficients; Liquidity and Capital Structure

Model		Unstandardized Coefficients			
		B	Std. Error	t	Sig.
1	(Constant)	.790	.013	59.968	.000
	Liquidity	.201	.035	5.728	.001

a Dependent Variable: Capital Structure

$$Y = 0.790 + 0.201X_2$$

Where Y is capital structure and X_2 is liquidity

The results from Table 7 showed an R squared of 0.030. This means that liquidity explains 3% of changes in the capital structure of manufacturing firms in Nairobi County, Kenya. The findings imply that there other factors that influence capital structure more than liquidity.

The analysis of variance results in Table 8 indicated that the model linking liquidity to capital structure was statistically significant. This was supported by F statistic of 32.810 and p value of 0.000, which was less than the critical p value of 0.05. The results indicate that liquidity was a good predictor of capital structure.

The results revealed that liquidity had a positive and significant effect on capital structure of manufacturing firms in Nairobi County, Kenya ($\beta=0.201$, $p=0.001$). This means that a one unit increase in liquidity increases capital structure by 0.201 units.

Following the regression results in Table 9; the null hypothesis (H_{02}) that liquidity has no significant effect on capital structure of manufacturing firms in Nairobi County, Kenya, was rejected since the P value $=0.001 < 0.05$. Therefore, the alternative hypothesis which states that, liquidity has a significant effect on capital structure of manufacturing firms in Nairobi County, Kenya was accepted.

The findings support those of Anderson and Carverhill (2010) who analyzed the liquidity and capital structure and found that higher levels of long-term debt will result in higher levels of liquid asset holding and a reduction in the optimal use of short-term debt.

Effect of Firm Growth on Capital Structure

The research sought to determine the effect of firm growth on the capital structure of manufacturing firms in Nairobi County, Kenya. Model summary, ANOVA and regression coefficient results are presented in Table 10, 11 and 12 respectively.

Table 10: Model Summary; Firm Growth and Capital Structure

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.709 ^a	.503	.503	.3048451

a Predictors: (Constant), Growth

Table 11: ANOVA; Firm Growth and Capital Structure

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	99.605	1	99.605	1071.819	.000 ^b
	Residual	98.320	1058	.093		
	Total	197.925	1059			

a Dependent Variable: Capital Structure

b Predictors: (Constant), Growth

Table 12: Regression Coefficients; Firm Growth and Capital Structure

Model		Unstandardized Coefficients			Sig.
		B	Std. Error	t	
1	(Constant)	5.483	.143	38.243	.000
	Growth	-1.674	.051	-32.739	.000

a Dependent Variable: Capital Structure

$$Y = 5.483 - 1.674X_3$$

Where Y is capital structure and X_3 is growth

The results in Table 10 showed an R squared of 0.503. This means that growth explains 50% of changes in the capital structure of manufacturing firms in Nairobi County, Kenya. The findings imply that there other factors that influence capital structure but are not included in this model.

The analysis of variance results in table 11 indicated that the model linking growth to capital structure was statistically significant. This was supported by F statistic of 1071.819 and p value of 0.000, which was less than the critical p value of 0.05. The results implied that growth was a good predictor of capital structure.

The results revealed that growth had a negative and significant effect on capital structure of manufacturing firms in Nairobi County, Kenya ($\beta = -1.674$, $p = 0.000$). This means that a one unit increase in growth would decrease capital structure by 1.674 units.

Following the regression results in Table 12; the null hypothesis (H_{03}) that growth has no significant effect on capital structure of manufacturing firms in Nairobi County, Kenya was rejected since the P value $= 0.000 < 0.05$. Therefore, the alternative hypothesis which states that, growth has a significant effect on capital structure of manufacturing firms in Nairobi County, Kenya was accepted.

The findings agree with Frielinghaus, Mostert and Firer, (2015) argument that growth opportunity of the firms has a relationship with the firm's capital structure. Particularly, growth

rate indicates a high equity financing and a low debt financing. Similarly, Rajan and Zingales (1995) found a negative relationship between growth opportunities and leverage.

Effect of Non-debt Tax Shield on Capital Structure

The study sought to determine the effect of non-debt tax shield on the capital structure of manufacturing firms in Nairobi County, Kenya. Model summary, ANOVA and regression coefficient results are presented in Table 13, 14 and 15 respectively.

Table 13: Model Summary; Non-debt Tax Shield and Capital Structure

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.486 ^a	.236	.235	.3780142

a Predictors: (Constant), Non-debt tax shield

Table 14: ANOVA; Non-debt Tax Shield and Capital Structure

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	46.743	1	46.743	327.111	.000 ^b
	Residual	151.183	1058	.143		
	Total	197.925	1059			

a Dependent Variable: Capital Structure

b Predictors: (Constant), Non-debt tax shield

Table 15: Regression Coefficients; Non-debt Tax Shield and Capital Structure

Model		Unstandardized Coefficients			
		B	Std. Error	t	Sig.
1	(Constant)	4.013	.178	22.536	.000
	Non-debt tax shield	-3.461	.191	-18.086	.000

a Dependent Variable: Capital Structure

$$Y = 4.013 - 3.461X_4$$

Where Y is capital structure and X_4 is Non-debt tax shield

The results in Table 13 showed an R squared of 0.236. This means that non-debt tax shield accounts for 24% of variations in the capital structure of manufacturing firms in Nairobi County, Kenya. The findings imply that there are other factors that influence capital structure but are not included in this model.

The analysis of variance results in table 14 indicated that the model linking non-debt tax shield to capital structure was statistically significant. This was supported by F statistic of 327.111

and p value of 0.000, which was less than the critical p value of 0.05. The results implied that non-debt tax shield was a good predictor of capital structure.

The results revealed that non-debt tax shield had a negative and significant effect on capital structure of manufacturing firms in Nairobi County, Kenya ($\beta = -3.461$, $p = 0.000$). This means that a one unit increase in non-debt tax shield would decrease capital structure by 3.461 units.

Following the regression results in Table 15; the null hypothesis (H04) that non-debt tax shield has no significant effect on capital structure of manufacturing firms in Nairobi County, Kenya was rejected since the P value $= 0.000 < 0.05$. Therefore, the alternative hypothesis which states that non-debt tax shield has a significant effect on capital structure of manufacturing firms in Nairobi County, Kenya was accepted.

The findings concur with Zender, (2010) argument that tax deductions for depreciation and investment tax credits are substitutes for the tax benefits of debt financing in a firm. As a result, firms with large non-debt tax shields relative to their expected cash flow include less debt in their capital structures. The effective tax rate has been used as a possible determinant of the capital structure choice.

Effect of Profitability on Capital Structure

The study sought to determine the effect of profitability on the capital structure of manufacturing firms in Nairobi County, Kenya. Model summary, ANOVA and regression coefficient results are presented in Table 16, 17 and 18 respectively.

Table 16: Model Summary; Profitability and Capital Structure

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.256 ^a	.065	.065	.4181389

a Predictors: (Constant), Profitability

Table 17: ANOVA; Profitability and Capital Structure

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.944	1	12.944	74.035	.004 ^b
	Residual	184.981	1058	.175		
	Total	197.925	1059			

a Dependent Variable: Capital Structure

b Predictors: (Constant), Profitability

Table 18: Regression Coefficients; Profitability and Capital Structure

Model		Unstandardized Coefficients			
		B	Std. Error	t	Sig.
1	(Constant)	.816	.013	62.810	.000
	Profitability	-.028	.003	-8.604	.004

a Dependent Variable: Capital Structure

$$Y = 0.816 - 0.028X_5$$

Where Y is capital structure and X_5 is Profitability

The results in Table 16 showed an R squared of 0.065. This means that profitability accounts for 7% of variations in the capital structure of manufacturing firms in Nairobi County, Kenya. The findings imply that there other factors that influence capital structure but are not included in this model

The analysis of variance results in Table 17 indicated that the model linking profitability to capital structure was statistically significant. This was supported by F statistic of 74.035 and p value of 0.000, which was less than the critical p value of 0.05. The results implied that profitability was a good predictor of capital structure.

The results revealed that profitability had a negative and significant effect on capital structure of manufacturing firms in Nairobi County, Kenya ($\beta = -0.028$, $p = 0.004$). This means that a one unit increase in profitability would decrease capital structure by 0.028 units. The findings are similar to those of Booth et al. (2011) who established that profitable firms in developing countries carry less debt. Further, Verbeek and Verwijmeren (2011) found empirical evidence that profit is used to internally finance the future projects.

Following the regression results in Table 18; the null hypothesis (H_0) that profitability has no significant effect on capital structure of manufacturing firms in Nairobi County, Kenya was rejected since the P value $= 0.004 < 0.05$. Therefore, the alternative hypothesis which states that profitability has a significant effect on capital structure of manufacturing firms in Nairobi County, Kenya was accepted.

Effect of Combined Firm Characteristics on the Capital Structure

This section provides regression results on the joint effect of firm characteristics on the capital structure of manufacturing firms in Nairobi County, Kenya. Model summary, ANOVA and regression coefficient results are presented in Table 19, 20 and 21 respectively.

Table 19: Model Summary; Firm Characteristics and Capital Structure

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	.822a	0.675	0.673		0.247186

a Predictors: (Constant), Regulations, Growth, Profitability , Liquidity, Firm size, Non-debt tax shield

Table 20: ANOVA; Firm Characteristics and Capital Structure

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	133.586	6	22.264	364.385	.000b
	Residual	64.339	1053	0.061		
	Total	197.925	1059			

a Dependent Variable: Capital Structure

b Predictors: (Constant), Regulations, Growth, Profitability , Liquidity, Firm size, Non-debt tax shield

Table 21: Regression Coefficients; Firm Characteristics and Capital Structure

Model		B	Std. Error	t	Sig.
1	(Constant)	1.556	0.286	5.448	0.000
	Firm size	0.263	0.017	15.011	0.000
	Liquidity	0.0064	0.011	0.586	0.558
	Growth	-1.154	0.086	-13.35	0.000
	Non-debt tax shield	-0.055	0.0105	-5.261	0.001
	Profitability	-0.029	0.002	-14.425	0.000

a Dependent Variable: Capital Structure

$$Y = 1.556 + 0.263X_1 - 1.154X_3 - 0.055X_4 - 0.029X_5$$

Where Y is capital structure and X1 is firm size; X3 is growth; X4 is non-debt tax shield; and X5 is profitability

The findings in Table 19 revealed that an R square of 0.675. This implies that all the firm characteristics (firm size, liquidity, growth, non-debt tax shield and profitability) accounts for 68% of variations in capital structure of manufacturing firms.

The analysis of variance results in Table 20 indicated that the model linking firm characteristics to capital structure was statistically significant. This was supported by F statistic of 364.385 and p value of 0.000, which was less than the critical p value of 0.05. The null hypothesis (H0) that firm characteristics have no significant effect on capital structure of manufacturing firms in Nairobi County, Kenya was rejected based on ANOVA findings in Table 21 (the calculated F statistic, 364.385 > critical F statistic, 2.10). The ANOVA results also indicate P value of $0.000 < 0.05$, indicating a statistical significant relationship between firm characteristics and

capital structure of manufacturing firms. This implies that combined firm characteristics had a significant influence on capital structure of manufacturing firms in Nairobi County, Kenya.

The combined results indicated that firm size had a positive and significant effect on capital structure of manufacturing firms in Nairobi County, Kenya ($\beta = 0.263$, $p = 0.000$). This implied that increase in firm size by one unit would lead to increase in capital structure by 0.263 units. The study findings were consistent with that of Michaelas, Chittenden & Poutziouris (1999) who also found a positive relationship between size and the debt maturity structure of companies. However, the findings are contrary to the pecking order theory of the capital structure that predicts a negative relationship between leverage and size, with larger firms exhibiting increasing preference for equity relative to debt.

The findings also revealed that growth had a negative and significant effect on capital structure of manufacturing firms in Nairobi County, Kenya ($\beta = -1.154$, $p = 0.000$). This implied that increase in growth by one unit would lead to decrease in capital structure by 1.154 units. The study findings agree with Frielinghaus, Mostert and Firer, (2015) argument that growth opportunity of the firms has a relationship with the firm's capital structure. Similarly, Rajan and Zingales (1995) found a negative relationship between growth opportunities and leverage.

The results further indicated that non-debt tax shield had a negative and significant effect on capital structure of manufacturing firms in Nairobi County, Kenya ($\beta = -0.055$, $p = 0.001$). This denoted that increase in non-debt tax shield by one unit would lead to reduction in capital structure by 0.055 units. The study findings concur with Zender, (2010) argument that tax deductions for depreciation and investment tax credits are substitutes for the tax benefits of debt financing in a firm. As a result, firms with large non-debt tax shields relative to their expected cash flow include less debt in their capital structures. The effective tax rate has been used as a possible determinant of the capital structure choice.

In addition, the study findings revealed that profitability had a negative and significant effect on capital structure of manufacturing firms in Nairobi County, Kenya ($\beta = -0.029$, $p = 0.000$). This meant that increase in profitability by one unit would lead to reduction in capital structure by 0.029 units. The research findings are similar to those of Booth et al. (2011) who established that profitable firms in developing countries carry less debt. Further, Verbeek and Verwijmeren (2011) found empirical evidence that profit is used to internally finance the future projects.

However, liquidity was found to have no significant effect on capital structure of manufacturing firms in Nairobi County, Kenya. This implied that change in liquidity had a negligible impact on the firms' capital structure.

Conclusions

This study made the following conclusions:

Firm size had a positive and significant effect on capital structure of manufacturing firms in Nairobi County, Kenya. The implication is that increase in firm size will increase capital

structure of manufacturing firms. This means that manufacturing firms will be more likely to increase their debt financing compared to reliance on equity financing.

Liquidity had a positive and significant effect on capital structure of manufacturing firms in Nairobi County, Kenya. The implication is that increase in liquidity will increase capital structure of manufacturing firms. This means that manufacturing firms will be more likely to increase their debt financing compared to reliance on equity financing.

Growth had a negative and significant effect on capital structure of manufacturing firms in Nairobi County, Kenya. The implication is that increase in growth will decrease capital structure of manufacturing firms. This means that manufacturing firms will be more likely to reduce their debt financing and instead use more equity financing.

Non-debt tax shield had a negative and significant effect on capital structure of manufacturing firms in Nairobi County, Kenya. The implication is that increase in non-debt tax shield will decrease capital structure of manufacturing firms. This means that manufacturing firms will be more likely to reduce their debt financing and instead use more equity financing.

Profitability had a negative and significant effect on capital structure of manufacturing firms in Nairobi County, Kenya. The implication is that increase in profitability will decrease capital structure of manufacturing firms. This means that manufacturing firms will be more likely to reduce their debt financing and instead use more equity financing.

Recommendations

The study recommended that manufacturing firms should capitalize on non-debt tax shield, growth and profitability. This will help them reduce reliance on debt financing and instead utilize internal financing. The mentioned firm characteristics were found to have a negative effect on capital structure, implying that they reduce debt levels. For sustainability purposes, the firms should focus on increasing equity financing through increase in growth, non-debt tax shield and profitability.

In addition, the government should streamline regulations touching on capital structure of manufacturing firms. This will provide a clear guideline on how manufacturing firms balance between debt and equity financing.

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