

# **DO THE MILLER AND MODIGLIANI RELEVANCE AND IRRELEVANCE THEORIES OF CAPITAL STRUCTURE HOLD AMONG LISTED MANUFACTURING COMPANIES? EVIDENCE FROM KENYA**

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## **Abstract**

The study tested the Miller and Modigliani relevance and irrelevance theories of capital structure among quoted manufacturing companies in Kenya using a sample of eleven (11) listed manufacturing firms in the Nairobi Stock Exchange in the period 2006 to 2019. The findings invalidated the capital structure irrelevance theory of Modigliani and Miller (1958) among listed manufacturing firms in Kenya. On the other hand, the study finding validated the capital structure theory of Modigliani and Miller (1963). It suggests that capital structure is relevant among the listed firms in Kenya. The study recommends that researches be conducted to test the theories on the market value of small and older firms in sectors of Nigeria economy and in other Sub-Saharan African countries. The study contributed to knowledge in that it is the first to validate the Modigliani and Miller irrelevance and relevance theories of capital structure among quoted firms in Kenya using advance dynamic panel estimation in the form of two step system general methods of moment.

**Keywords:** Capital Structure, Short Term Debt, Long Term Debt, Tax Shield, Firm Value

**JEL Classification:** M1, M4

## **1. INTRODUCTION**

Effective acquisition of capital for operations is always a basic decision firms do strive to engage in. In recognition of implication of this, Modigliani and Miller (1958) carried out a pioneer study which has become the basis of contemporary thinking on capital structure. They emphasize that in a world with perfect capital markets, the value of a firm does not depend on its financing decisions. Modigliani and Miller (1958) seek to establish that the choice of capital structure in the absence of market frictions such as bankruptcy cost, transaction cost and agency cost, has no impact on the value of a firm. In their view, capital structure of a firm is irrelevance. This they referred to as capital structure irrelevance theory.

Modigliani and Miller (1963) after evaluating the presence of market frictions and imperfections such as financial distress, taxes, agency problems and asymmetric information, declared that the choice of capital structure is relevant on firms' value (Harris & Raviv, 1991; Myers, 2001; Frank & Goyal, 2007). Modigliani and Miller (1963) demonstrate that in a frictionless world, financial leverage is unrelated to firm value. Albeit, in a world with tax-deductible interest payments, firm value and capital structure are positively related. They emphasized that capital structure is relevant on a firm value. Modigliani and Miller (1963) under the capital structure relevance theory took taxes into consideration and conclude that debt is helpful to firm operation given its tax shield implication. When debt financing is introduced, a firm value increases due to tax shield effects. Tax shield allows firms to reduce their expected tax bill and increase their after-tax cash flows (Modigliani & Miller, 1963).

While it appears that the Modigliani and Miller (1958, 1963) theories fail to show a true description of how firms finance their operations, those theories however influenced the emergence of the trade-off theory (Odeeye, 2014; Stancic, Jankoric & Cupic, 2016). The modified M & M capital structure relevance theory led to the development of the static trade-off theory which suggests that the optimal capital structure can be determined by finding the balance between benefits and costs of debt (Martin, Cox, & MacMinn, 1988; Fama & French, 2005). The emergence of the static trade-off theory preceded trade-off theory. The trade-off theory was developed by Kraus and Litzenberger in 1973 to explain the benefit and cost of a firm employing debts in its operations. The trade-off theory of capital structure holds that if higher level of debt has the likelihood of disposing firms to serious financial distress, the benefit of tax shielded earnings may significantly offset financial distress cost, and as such, it is possible for a firm to borrow up to a point where tax shield advantage is equal to possible financial distress cost (Oke & Obalade, 2015).

With the introduction of tax arising from debt usage, it becomes explicit that capital structure is relevant on a firm value, notwithstanding that the employment of debt financing attracts a cost. The cost is in terms of bankruptcy cost due to excess debt financing (Oino, 2014). Balancing the effect of debt in firms often requires determining the amount of debt a firm has to employ in order to maximize its market value.

The analysis of the benefit of debt usage on firm value as explained in trade-off theory was criticized in the pecking order theory developed by Myers and Majluf in 1984. The pecking order theory states that firms select capital structure in the preference order of internal finance (retained earnings), debt and followed by equity. Myers and Majluf (1984) opine that firms do use retained earnings that are less costly, followed with the use of debt, which has a minimal information cost and then finally employ equity capital which attracts more transaction and asymmetric information costs. The pecking order has a pyramid structure, with retained earnings at the lower pyramid, debt at the middle pyramid and equity at the upper pyramid.

This pyramidal structure reflects the firm's appetite for risk in a descending order manner.

Hirdinis (2019) states that if value of debt to equity ratio gets higher, then the firm value will increase, as long as, the debt-equity ratio has not reached its optimum point in accordance with trade-off theory. In support of the trade-off theory, pecking order theory and agency cost theory, Jensen and Meckling (1976) argue that if capital structure decision is relevant in a perfect market, then, imperfection which exist in the real world may be adduce for its relevance on firm value. Firm value is very essential because it reflects firm's performance that could affect investors' perception towards the firm (Purwanto & Agustin, 2017). Firm value is the expected value of shareholder's investment and expectation of company's total value (Sugihen, 2003).

Sanders (1998) employed varying methods to classify capital structure theories in terms of whether a particular theory presumes the existence of optimal financial policy and how the theory describes it. The author states that there are theories which support the existence of an optimal debt-equity mix (that is, the trade-off theory), the existence of optimal financial hierarchy (the pecking order theory) and the Modigliani and Miller relevance theory of capital structure in relation to a firm's value. Other various empirical studies have also been conducted to examine the impact of the capital structure relevance and irrelevance theory on firm value in different markets, with mixed evidence. For instance, Modigliani and Miller (1958), Phillips and Sipahioglu (2004) researches indicate capital structure is negative on firm value; while studies of Modigliani and Miller (1963); Miller (1977); Myers and Majluf (1984); Abor (2005); Zeitun et al.(2007), Onaolapo et al.(2010), Ali Saeedi et al.(2011), Wenjuan (2011), Nour (2012), Zuraidah (2012) indicate that capital structure is either positive or negative on firm value. The results of these studies indicate that firm value is a linear function of capital structure, meaning that the slope of the firm value is constant in relation to different debt ratios. However, in the emerging economy of Kenya, the test on the impact of capital structure relevance and irrelevance theories on listed manufacturing firms lacks empirical evidence to the best of our knowledge, hence this study is undertaken.

## **2. EMPIRICAL REVIEW**

Titman and Wessels (1988), Rajan and Zingales (1995); Fama and French (2002) research confirmed that most profitable firms are more likely to borrow less. The result is however not consistent with the trade-off theory expectations those most profitable firms do borrow more to take advantage of the debt's tax advantage. These have received more empirical test over time in developed and developing countries. For instance, Ramadan (2015) carried out an empirical investigation on the trade-off theory in Jordan between 2000 and 2014. The result shows that more profitable Jordanian manufacturing firms tend to issue more equity and less debt to finance their needs.

The study also found a direct link between firm size and leverage, which was found to be in line with the trade-off theory. The finding is suggestive that large firms try to finance their needs of fund via issuance of debt instead of equity. Oke and Obalade (2015) tested the validity of optimal capital structure theory in Nigerian listed oil firms. Fixed and Random effect models were used to undertake the data analysis. The study outcome confirmed the static trade-off theory which holds that high profitable firms use more debt due to tax shield substantial effect and little bankruptcy risk.

Antwi, Mills and Zhao (2012) examined the impact of capital structure on a firm's value in Ghana using 34 companies quoted on the Ghana Stock Exchange (GSE) for the year ended 31st December 2010. The ordinary least squares method of regression was employed in carrying out this analysis. The result of the study reveals that in an emerging economy like Ghana, equity capital as a component of capital structure is relevant to the value of a firm, and Long-term-debt was also found to be the major determinant of a firm's value.

Previous researches on the implication of firm size in capital structure are inconclusive. For instance, Titman and Wessels (1988); Wald (1999) research suggest that large firms are more diversified and have fewer fluctuations in earnings, which enables them to operate with a higher debt. In accordance with the static trade-off theory, creditors are willing to grant a loan to a large firm compared to a small firm because of lower agency costs peculiar to leverage (Abor, 2008). Also, given that the bankruptcy costs are in inverse relationship with the company size, a relationship between the company size and leverage is positive (Bas, Muradoglu, & Phylaktis, 2009). Age is important in the study of capital structure of a firm (Bhaird, 2010). Normally, financing institution will evaluate the creditworthiness of the firm over a period of time. The younger the firm, the less is the ability to access external financing. According to Klapper, Sarria-Allende and Sulla (2002), firms established less than four years are more dependent on informal financing and less depend on bank financing. Older firms tend to have more debt ratio in order to expand their business (Petersen & Rajan, 1994). It is confirmed that age is positively related to debt (Hall et.al, 2004).

### **3. METHODOLOGY**

This study seeks to determine the M & M capital structure relevance and irrelevance theory. Thus, the focus is to ascertain the implication of the trade-off theory and static trade off theory on firm value in Kenya. The ex-post facto -research design is employed in the study. Eleven (11) listed manufacturing firms were selected from the Kenyan Stock Exchange, using the purposive random sampling technique for the period 2006 to 2019. This represents one hundred and fifty four (154) firm- annual observations. Descriptive statistics, correction matrix and two step system general method of moment (SGMM2) were employed to analyse the data. Diagnostic tests were used to determine the BLUE (best, linear, unbiased estimate) of the properties of the model. The model used is underpinned to the works

of Ramadan (2015) who carried out an empirical assessment of the capital structure relevance theory among Jordanian firms, following the tenet of the trade-off and static trade –off theories. This study modifies and adapts the models as follows.

$$TobinQ_{it} = \beta_0 + \beta_1 Std_{it} + \beta_2 Ltd_{it} + \beta_3 Fsz_{it} + \beta_4 Fage_{it} + \dots \dots \dots (1).$$

$$COA_{it} = \beta_0 + \beta_1 TR * Std_{it} + \beta_2 TR * Ltd_{it} + \beta_3 TR * Td_{it} + \beta_4 Fsz_{it} + \beta_5 Fage_{it} + \epsilon_{it} \dots \dots \dots (2)$$

Where,  $COA_{it}$  represents Cash flow from operation to asset ratio, denoting firm value of  $i$  company in  $t$  period; TobinQ represents Tobin Q;  $TR * STD_{it}$  represents interaction of tax rate with log of short term debt of  $i$  company in  $t$  period;  $TR * LTD_{it}$  represents interaction of tax rate with log of long term debt of  $i$  company in  $t$  period;  $TR * TD_{it}$  represents interaction of tax rate with log of total debts of  $i$  company in  $t$  period;  $Std_{it}$  represents short term debt of  $i$  company in  $t$  period;  $Ltd_{it}$  represents long term debt of  $i$  company in  $t$  period;  $Td_{it}$  represents total debts;  $\sum Control\ variables_{it}$  represents firm size and firm age of  $i$  company in  $t$  period;  $i$  represents individual company in the sample size;  $t$  represents period the study covers; and  $\epsilon$  represents error term acting as a surrogate in the models while  $\beta_0$  represents intercept. The *a priori* expectations of this study are that  $\beta_1 - \beta_5 > 0$  in the stochastic models are expected to be significant and positive.

#### 4. EMPIRICAL ANALYSIS

This sub-section seeks to validate the capital structure irrelevance and relevance theories among listed firms in the Nairobi Stock Exchange in the period observed. Table 1 represents analysis of the capital structure irrelevance theory. While table 2 the existence or otherwise of the capital structure relevance theory in Kenya.

**Table 1:** Dynamic Regression result on the test of the Capital Structure Irrelevance Theory

	(1) OLS	(2) RE	(3) FE	(4) DGMM1	(5) DGMM2	(6) SGMM1	(7) SGMM2
L.Tobin Q	0.712*** [0.04]	0.678*** [0.04]	0.545*** [0.05]	0.662*** [0.06]	0.186 [0.31]	0.680*** [0.04]	0.667*** [0.18]
Std <sub>it</sub>	0.008*** [0.00]	0.009*** [0.00]	0.012*** [0.00]	0.013*** [0.00]	0.045*** [0.02]	0.009*** [0.00]	0.017* [0.01]
Ltd <sub>it</sub>	0.005*** [0.00]	0.005*** [0.00]	0.004*** [0.00]	0.005*** [0.00]	0.016** [0.01]	0.005*** [0.00]	0.006 [0.00]
Fsize	0.022*** [0.01]	0.023*** [0.01]	0.025*** [0.01]	0.025*** [0.01]	-0.032 [0.04]	0.023*** [0.01]	0.018 [0.02]
Fage	-0.001 [0.00]	-0.002 [0.00]	- [0.01]	-0.020*** [0.01]	-0.033** [0.04]	-0.002 [0.01]	-0.014 [0.02]
Constant	-0.126 [0.10]	-0.088 [0.12]	0.501** [0.20]			-0.103 [0.11]	0.136 [0.09]

Observations	143	143	143	132	132	143	143
No. of instruments				50	50	99	91
No. of groups		11	11	11	11	11	11
Arellano-Bond: AR(1)				0.000	.	0.000	0.132
Arellano-Bond: AR(2)				0.076	.	0.089	0.265
Hansen test (p-val)					1.000		1.000

Standard errors in brackets. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Source: Author's Computation

**Table 2: Dynamic Regression result on the test of the Capital Structure Relevance Theory**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Coa	Coa	Coa	Coa	Coa	Coa	Coa
L.Coa	0.353*** [0.05]	0.353*** [0.05]	0.306*** [0.05]	-0.007 [0.11]	0.534** [0.27]	0.259*** [0.05]	0.693*** [0.28]
TR*stdbt	-0.003 [0.01]	-0.003 [0.01]	0.009 [0.01]	0.003 [0.01]	0.003 [0.01]	-0.001 [0.01]	0.000*** [0.01]
TR*Ltdbt	-0.000 [0.00]	-0.000 [0.00]	-0.000* [0.00]	-0.000 [0.00]	-0.000 [0.00]	-0.000 [0.00]	0.000*** [0.00]
TR*tdbt	-0.000 [0.00]	-0.000 [0.00]	-0.000 [0.00]	-0.000 [0.00]	-0.000 [0.00]	-0.000 [0.00]	0.000*** [0.00]
Fsize	0.527*** [0.03]	0.527*** [0.03]	0.548*** [0.03]	0.723*** [0.07]	0.431** [0.19]	0.577*** [0.03]	0.317 [0.23]***
Fage	-0.021** [0.01]	-0.021** [0.01]	-0.023 [0.02]	-0.036 [0.03]	-0.020 [0.03]	- [0.01]	-0.001 [0.02]***
Constant	- 2.380*** [0.27]	- 2.380*** [0.27]	- 2.491*** [0.63]			- 2.595*** [0.25]	-1.694 [2.15]
Observations	143	143	143	132	132	143	143
No. of instruments				50	50	99	99
No. of groups		11	11	11	11	11	11
Arellano-Bond: AR(1)				0.006	0.159	0.063	.
Arellano-Bond: AR(2)				0.840	0.218	0.003	0.178
Hansen test (p-val)					1.000		1.000

Standard errors in brackets. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Source: Author's Computation

In table 1, the result of column 7 (SGMM2) indicates that the coefficient value of the lag Tobin Q (L.TOBIN Q) is positive and statistically significant (0.667). In column 7, the coefficient values of short term debt and long term debts are positive and statistically insignificant (0.017; 0.006) on firm value across the sample firms. This could be adduced to no consideration of tax shield elements in debt usage. The finding confirmed the capital structure irrelevance theory of Modigliani and Miller (1958). Firm size is positive and statistically in significant in column 7, (0.018), while firm age is negative (-0.014) and does not contributes to firm value across the sample firms. The implication is that though size is very

significant towards the relevance of capital structure by listed firms in Kenya, it is really not significant.

In table 2, the result in column 7 indicates that the coefficient value of the lag cash flow to assets ratio (L.COA) is positive and statistically significant (0.693). In column 7, the coefficient values of tax shield from short term debt, long term debts and total debts are positive and statistically significant (0.000; 0.000; 0.000) on firm value across the sample firms. The finding confirmed the capital structure relevance theory. This could be added to the tax shield element from debts usage by the firms. The finding agrees with Modigliani and Miller (1963); Oke and Obalade (2015). Firm size is positive and statistically significant in column 7, (0.317), while firm age is negative and significant (-0.001) on firm value across the sample firms. The implication is that size is very significant towards the relevance of capital structure by listed firms in Kenya. The finding is in tandem with the research outcome of Daskalakis and Psillaki (2008); Hussain and Matlay (2007); Booth et al (2001); Amidu (2007); Abor and Biekpe (2006); Abor and Biekpe (2009); Zhao, Katchora and Barry (2004).

## 5. CONCLUSION AND RECOMMENDATIONS

The study tested the M & M relevance and irrelevance theories of capital structure among quoted manufacturing companies in Kenya. The findings invalidated the capital structure irrelevance theory of Modigliani and Miller (1958) among listed manufacturing firms in Kenya. On the other hand, the study finding validated the capital structure theory of Modigliani and Miller (1963). It suggests that capital structure is relevant among the listed firms in Kenya. This is because of the tax shield element in the use of debts by the firms which contributed to their performance and market value. The study finding affirms the trade-off and static trade-off theory in literature. The study recommends that researches be conducted to test the theories on the market value of small and older firms in sectors of Nigeria economy and in other Sub-Saharan African countries. The study contributed to knowledge in that it is the first to validate the Modigliani and Miller (1958, 1963) irrelevance and relevance theories of capital structure among quoted firms in Kenya using advance dynamic panel estimation in the form of two step system general methods of moment (SGMM2).

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