



Determinants of capital structure in Ethiopian private manufacturing sector

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Abstract

The study investigates firm-specific determinants of capital structure for a sample of 112 Ethiopian private manufacturing firms using a 10 years panel data for the period of 2005/06 - 2014/15. Random effect regression model was employed in obtaining the numerical estimates of the coefficients. Based on previous empirical studies and theories of capitals structure; firm age, firm size, Profitability, Tangibility, Growth, Liquidity, Non-Debts Tax Shields and Earning volatility were identified as explanatory variables. The result shows that Age, Profitability, Tangibility, Growth, Liquidity and Non-debt tax shield are statistically significant in affecting the capital structure of Ethiopian private manufacturing sector. On the other hand, size and earning volatility are statistically insignificant. In addition, sub-sector classifications were regressed in the independent variable as dummy variables to examine the stability and variability of the regression coefficients across sub sectors.

Keywords: capital structure, private manufacturing, panel data, random effect model

1. Introduction

In the modern economy finance plays a predominant role in achieving their ultimate objectives and often finance is termed as the life blood of business organization. Business enterprises require capital in order to run day to day affairs of the company, do necessary investments and grow faster. These actions are combined with high costs where both internal and external financing could be appropriate. In finance, capital structure refers to the way a company finances its assets through some combination of debt and equity. The selection of capital structure depends on the costs and benefits associated with the debt and equity financing. That means firms select the best mix of debt and equity that maximizes value of the firm which is called optimal capital structure.

The modern theory of capital structure was originally developed by Modigliani and Mille (1958) ^[31] also called MM theorem. It states that, capital structure choice is irrelevant to firm value in perfect capital market and there are no effects of tax. But after observing that the fundamental assumptions of Modigliani and Mille (1958) ^[31] are unrealistic and do not reflect real life conditions, Miller (1988) ^[30] has then relaxed the assumptions by suggested that a firm's value can be affected by financing choices when there is different tax regimes, information asymmetry problem between firm management and investors and agency cost. Since miller (1988) ^[30] different capital structure theories have evolved and a lot of empirical studies have been conducted to test capital structure theories as well as to find out the main the determinants of capital structure. Even though substantive research has been done in developed countries on this subject and provide some significant contribution to the general perception about corporate capital structure, still there is inconsistency and didn't provide a sound base for the empirical validity of the different theoretical models. Furthermore,

Myers (2001) ^[35] states that there are no any universally accepted theories of capital structure, the different theories of optimal capital structure depend on which economic aspect and firm characteristic we focus on.

In developing countries like Ethiopia, the issue of determinants of capital structure received little attention and not yet well investigated. In addition to this, according to Haileselesie (2009) ^[23] and Eldomiaty (2007) ^[17] developing countries have weak and inefficient financial market and which is highly characterized by information asymmetry unlike the developed countries. Therefore, this study may fill the knowledge gap to the determinants of capital structure by providing further new empirical evidence in these emerging market and developing economy countries like Ethiopia using a 10 years panel data of Ethiopian private manufacturing firms.

2. Theories of Capital Structure

Capital structure decision has been one of the most important and argumentative topics in corporate finance, since the study of Modigliani and Miller in 1958 ^[31]. Capital structure can be defined as the mix of owner-supplied fund called equity (usually reserves and surplus) and borrowed fund called debt (usually, bonds and loans) that a firm uses to finance business activities. The main decision here is whether to finance through debt, equity, or a combination of both. So the objective of any financial decision is to maximize the shareholder's wealth or increase the value of the firm. In a common word, capital structure is the relative proportions of debt and equity.

Many theories have been developed in the literature of finance for examining the determinants of capital structure. This section presents the fundamental theories of capital structure that are used in formulating the research hypothesis.

2.1 Trade-off Theory (TOT)

Trade-off theory indicates that there is an optimal capital structure that is able to maximize firm values by borrowing up to the point where the tax savings from additional money in debt are equal to the costs that results from the increased probability of financial distress (Modigliani and Miller, 1963)^[32]. Generally the main argument of this theory is there is a targeted leverage level to maximize firm value by trade-off (balancing) between the benefits and cost of debt financing based on bankruptcy costs, tax benefits and agency costs related to asset substitution.

2.2 The Pecking Order Theory

The Pecking order theory states the cost of financing increases with the increase in the asymmetric information. That is firms will finance new investment projects using a financing hierarchy that first prefers to use internal source of financing, then turn less risky debts and finally to issue equity as a last resort (Myers and Majluf, 1984)^[36]. The reason for this ranking was based on the existence of transaction costs and the asymmetric information. Because internal funding does not incur any transaction costs, firms considered internal fund as cheap that minimize financing cost. External debt was ranked next as it was cheaper and has fewer restrictions compared to issuing equity. From the asymmetric information perspective, this theory reflects that the firm's managers have relevant and reliable information about firms than the less informed outside investors.

2.3 Agency Cost Theory

Agency theory focuses on the costs that are created due to conflicts of interest between shareholders and managers and conflict of interest between shareholders and creditors. Agency cost theory considered debt to be a necessary factor that creates conflict between equity holders and managers (Jensen and Meckling, 1976)^[26]. Jensen and Meckling (1976)^[26] suggested that, given increasing agency costs with both the equity-holders and debt-holders, there would be an optimum combination of outside debt and equity to reduce total agency costs. Furthermore according to Harris & Raviv (1991) the agency cost theory predicts an optimal capital structure and optimal capital structure can be obtained by trading of the agency cost of debt against the benefit of debt.

2.4 Signaling Theory

Signaling theory states that managers in exercising their choice of capital structure will send out a signal to the market or investors about the firm's prospects (Ross, 1977)^[41]. According to Ross, (1977)^[41] managers, known as insiders, know the true distribution of firm returns, but investors do not. The managers prefer equity financing than debt as debt can lead to managers losing jobs if firms go bankrupt. Furthermore according to Harris and Raviv, (1991), potential Investors take large level of debt as a signal of "higher quality" and therefore, profitability is expected to be positively related to leverage. This theory states that, if managers believe that their firms have good prospects and undervalued, they will issue debt instead of selling shares. This will avoid the dilution of ownership and keeping the benefit to the existing share holders. On the other hand, if

managers believe that their firms are overvalued and prospects are unwelcoming, they will issue shares instead of debt. This will help to avoid bankruptcy and to share the losses incurred with the new investors.

3. Determinants of capital structure and Literature driven Hypothesis

In order to analyze the determinants of capital structure of Ethiopian private manufacturing sector, the researcher formulated the null and alternate hypothesis in Consistent with the existing literature and previous empirical studies to test the relationship between the level of financial leverage and the independent variables. In this research study, due to the nature and availability of data the following hypothesis have been developed mainly from trade-off theory and pecking order theory and it also includes some other existing capital structure theories like agency cost theory and signaling theory.

3.1 Age of the firm

According to the trade-off theory, as a firm stays in business for a long period of time and proved itself as an ongoing business and accumulate good reputation over many years which supports in borrowing more debt. Older firm increases its capacity to acquire more debt by using its reputation in the debt market. Accordingly, trade-off theory suggested that older firms have higher level of leverage (Jensen and Meckling's, 1976)^[26].

In contrary to trade of theory, the pecking order theory states that older and more profitable firms have more internal resources at their disposal and tend to use internal funds rather than debt. Similarly, younger firms with high growth need to borrow more debt to support their growth opportunity (Myers and Majluf's, 1984)^[36]. As a result, pecking order theory suggested that a negative relationship between age and leverage.

Empirical studies like Abor (2008)^[1] and Ramalho and Silva (2009)^[40] found positive relationship between age and debt. Therefore, the researcher developed a hypothesis in consistent with the trade off theory.

Hypothesis 1

H₀ = There is significant positive relationship between age and financial leverage of a firm

H₁ = There is significant negative relationship between age and financial leverage of a firm

3.2 Size of the firm

According to the trade of theory, large firms have a better capacity for taking large of debt as compared to smaller firms. This is due to the fact that large firms are more diversified and usually face lower default risk or have lower bankruptcy risk. Similarly, smaller firms are expected to have smaller debt ratios because of the information asymmetry problem (Titman and Wessels, 1988)^[44].

In addition, signalling theory states that the positive link between size and leverage whereby large firms provide more information than small ones, hence, they could assure creditors of their ability to settle up the debts.

In contrary to the trade off theory, Pecking Order Theory predicts a negative relationship between size and debt. This

implies that greater size allows a firm to accumulate more retained earnings and use less proportion of debt (Sogorb-Mira, 2008).

Generally the effect of size on leverage ratios is ambiguous from the theoretical point of view; some authors encountered a positive relation between size and leverage; some others reported negative relation and others also found statistically insignificant relationship between them. But majority of studies like Titman and Wessels (1988) ^[44], Rajan and Zingales (1995) ^[39], Al-Sakran (2001) ^[3], Pandey (2001) ^[38], Booth *et al.* (2001) ^[9], Huang and Song (2002) ^[24], Frank and Goyal (2005) ^[20] and De Jong *et al.* (2008) ^[14] found a significant positive relationship between firm size and leverage ratio. Therefore, the researcher developed a hypothesis in consistent with the trade of theory and signalling theory.

Hypothesis 2

H₀ = There is significant positive relationship between size and financial leverage of a firm

H₁ = There is significant negative relationship between size and financial leverage of a firm

3.3 Profitability

According to the pecking order theory, most profitable firms use internal source of funding where as low profitable firms use debt financing due to insufficient internal funds. Therefore it predicts a negative relationship between profitability and financial leverage (Rajan and Zingales, 1995) ^[39].

In contrast to the pecking order theory, trade-off theory predicts a positive relationship between profitability of a firm and financial leverage. The theory proposes that most profitable firms will prefer to be highly levered than less profitable firms in order to obtain tax shields. That is, firms tend to prefer more debt financing due to deductible interest, which reduces a firm's taxable income. Additionally, Creditors are more willing to provide credit to profitable firms, and bankruptcy costs go down when earnings go up.

In consistent with trade off theory, agency cost theory predicts profitable firms may face the agency problem of free cash flows, a situation in which managers may take advantage of accessible benefits. This will create conflicts between managers and shareholders and may lead to shareholders increasing their leverage in order to control managers by pushing to pay debt holders from the firm's cash flows (Jensen, 1986) ^[25].

Furthermore, inconsistent with trade off theory and agency cost theory, signalling theory predicts a positive relationship between profitability and leverage ratio according, because companies with a high amount of debt send a signal of its quality and strength to the market by increasing leverage (Al-Najjar, 2011) ^[2].

Most empirical studies show a negative relationship between profitability and leverage of a firm, which is consistent with the pecking order theory, for example the work of Titman and Wessels (1988) ^[44], Rajan and Zingales (1995) ^[39], Antoniou and Paudyal, (2002) ^[4], Bevan and Danbolt (2002) ^[7] and Shah and Khan (2007) ^[43] in developed countries. Therefore, the researcher developed a hypothesis in consistent with pecking order theory.

Hypothesis 3

H₀ = There is significant negative relationship between profitability and financial leverage of a firm

H₁ = There is significant positive relationship between profitability and financial leverage of a firm

3.4 Tangibility

According to the trade-off theory, firms with high composition of fixed assets are able to borrow more debt by pledging its tangible fixed assets as collateral. And this indicates the company has lower probability of financial distress plus less risk for lenders because tangible assets serve as collateral (Jensen and Meckling's, 1976) ^[26]. Therefore, financial leverage is expected to be linked with high tangible assets.

In supporting to the trade off theory, pecking order theory also states that firms with more tangible assets are subject to less information asymmetry which will create an advantage for a firm to sell secured debts (Myers and Majluf's, 1984) ^[36]. Hence, high financial leverage is expected to be linked with high tangible assets.

Moreover, agency cost theory also states there is a potential conflict of interests between shareholders and creditors when companies undertaking risky investments and in this case creditors main objective is to minimize the risk by requiring collateral (Jensen and Meckling, 1976) ^[26]. Therefore according to the agency cost theory there is a positive relationship between tangibility and leverage.

The majority of empirical studies in developed countries also found a positive relationship between tangibility and leverages like (Rajan & Zingales, 1995; Titman and Wessels, 1988) ^[39, 44]. Therefore, the researcher developed a hypothesis in consistent with both pecking order theory and trade off theory.

Hypothesis 4

H₀ = There is significant positive relationship between tangibility and financial leverage of a firm

H₁ = There is significant negative relationship between tangibility and financial leverage of a firm

3.5 Growth

Pecking order theory predicts that firms with higher growth potential are expected to have a positive association with financial leverage because internal financing might not be sufficient to finance their growth (Myers and Majluf's, 1984) ^[36]. In another word, firms with high growth opportunities must undertake key investment projects which requires high amount of finance that exceeds their retained earnings, thus, it can be expected to borrow more and creditors are more willing to lend to firms with high growth potential. Generally, pecking order theory states that when internal finance is not sufficient, firms prefer debt rather than external equity for financing growth opportunities.

In contrary to the pecking order theory, agency cost theory and trade off theory predict a negative association between growth and debt. Agency cost theory suggests that a company with better growth opportunity is encouraged to invest in riskier projects that increase the shareholders' wealth but creditors are either unwilling to lend to risky projects or increasing the cost of borrowing to compensate for the

additional risk. Therefore, due to the high cost of borrowing firms tend to avoid debt and divert into equity financing. Moreover, trade off theory also suggests a negative relationship between leverage and growth by indicating that the cost of financial distress increases with growing firms, and this forcing managers to reduce the proportion of the debt (Antoniou *et al.*, 2008) ^[5].

Many previous empirical studies like Marsh (1982) ^[28], Michaelas *et al.* (1999) ^[29], Bevan and Danbolt (2002) ^[7], Crnigoj and Mramor (2009) ^[13], Noulas and Genimakis (2011) ^[37] and Al-Najjar (2011) ^[2] found a positive relationship between growth and debt ratio. Therefore, the researcher developed a hypothesis in consistent with pecking order theory.

Hypothesis 5

H₀ = There is significant positive relationship between growth and financial leverage of a firm

H₁ = There is significant negative relationship between growth and financial leverage of a firm

3.6 Liquidity

Pecking order theory predicts that highly liquid firms prefer to use internal to external funding. On the other hand, less liquid firms are less likely to access debt, since bankruptcy associated costs are high. Therefore, it predicts a negative relationship between liquidity and financial leverage ratio. Pecking order theory emphasizes that firms with a high level of liquidity could finance their activities using their current asset or accumulated internal fund without raising debt (Myers and Majluf's, 1984) ^[36].

In contrary to the pecking order theory, trade of theory predicts that firms with high liquidity ratio have relatively high debt ratios due to greater ability to meet short-term obligations. In another words, highly liquid firms appear to have low default risk and tend to use high leverage (Karadeniz *et al.* 2009). Therefore, trade off theory predicts a positive relationship between liquidity and debt ratio.

The relationship between liquidity and leverage is a controversial issue. Various researchers investigated the relationship between liquidity and financial leverage, some researchers found a positive relation and others reported negative relationship.

Previous studies like Rajan and Zingales (1995) ^[39], Deesomsak *et al.* (2004) ^[16], De Jong *et al.* (2008) ^[14] and Moosa *et al.* (2011) ^[34] found a significant negative relationship between liquidity and debt ratio. Therefore, the researcher developed a hypothesis in consistent with pecking order theory.

Hypothesis 6

H₀ = There is significant negative relationship between liquidity and financial leverage of a firm

H₁ = There is significant positive relationship between liquidity and financial leverage of a firm

3.7 Non-Debts Tax Shields

In the context of trade-off theory, Firms could reduce tax payments by using more debt rather than equity in financing their activities but in the presence of high non-debt tax shields firms could decrease their debt financing because non-debt tax shields provide alternative to interest tax shield.

According to DeAngelo and Masulis, (1980) ^[15], non-debt tax shields can be substitutes for the tax benefit of debt financing and a firm with large non-debt tax shields is expected to use less debt. Furthermore, Antoniou *et al.*, (2008) ^[5] suggest that firm with high amount of non-debt tax shields tends to have lower amount of debt proportion. Thus trade off theory predicts that non-debt tax shield have a negative impact on leverage.

The majority of previous empirical studies like Scott (1977) ^[42], Bradley *et al.* (1984) ^[10, 11], Moore (1986) ^[33] and Cortez and Susanto (2012) ^[12] found negative relationship between non-debt tax shield and debt ratio. Therefore, the researcher developed a hypothesis in consistent with trade off theory.

Hypothesis 7

H₀ = There is significant negative relationship between non-debt tax shields and financial leverage of a firm

H₁ = There is significant positive relationship between non-debt tax shields and financial leverage of a firm

3.8 Earning volatility

According to the trade off theory, Firms with high earning volatility face a higher risk default on debt payment. In this case it is very difficult to a firm get debt from creditors because creditors are unwilling to provide loan to risky firm or only they provide at high cost.

In line with the trade of theory, pecking order theory predicts that a negative relationship between earning volatility and financial leverage. Pecking order theory emphasizes that firms with high earning volatility are considered as risky business by creditors and debt financing in this case becomes very costly, so firms tend to accumulate their internal funds during profitable periods and use them during unstable periods.

Therefore the researcher developed the research hypothesizes in accordance to the majority research findings like (Titman and Wessel, 1988; Attaullah and Sufiullah, 2007 and Bhaduri, 2002) ^[44, 6, 8], which emphasizes that a significant negative relationship between earning volatility and financial leverage

Hypothesis 8

H₀ = There is significant negative relationship between earning volatility and financial leverage of a firm

H₁ = There is significant positive relationship between earning volatility and financial leverage of a firm

4. Predicted sign of explanatory variables

The following table1 shows a summary of the Predicted sign between the explanatory variables and the dependent variable in relation to the different theories of capital structure.

Table 1: Predicted Sign of Explanatory Variables

Explanatory Variables used in this study	Predicted signs	Sign based on the theories of capital structure
Age of firm	(+)	(+) Trade off theory (-) Pecking order theory
Size of firm	(+)	(+) Trade off theory, Agency cost theory and Signaling theory (-) Pecking order theory
Profitability	(-)	(-) Pecking order theory (+) Trade off theory, Agency cost theory and Signaling theory
Tangibility	(+)	(+) Pecking order theory, Trade off theory and Agency cost theory
Growth	(+)	(+) Pecking order theory (-) Trade off theory and Agency cost theory
Liquidity	(-)	(-) Pecking order theory (+) Trade off theory
Non-Debts Tax Shields	(-)	(-) Pecking order theory and Trade off theory
Earning volatility	(-)	(-) Pecking order theory and Trade off theory

5. Research methodology

5.1 Data source and sampling design

For the purpose of this study, Secondary data were obtained from Ethiopian revenue and customs authority (ERCA) data base, mainly balance sheet and income statement of the sample private manufacturing firms for a period of 10 years. According to the report of CSA of Ethiopia (2015), the numbers of business enterprises registered as large and medium scale manufacturing industries are 1733 enterprises of which 1641 business enterprises are registered as private and the remaining 92 business enterprises are registered as public enterprises.

Therefore, out of 1641 only 416 private manufacturing firms are registered as category “A” tax payers and reported their financial statement (balance sheet and income statement) to ERCA. 112 private manufacturing firms were selected as sample that fulfills the criteria set by the researcher. Private Manufacturing firms established after the years 2004/05 are automatically rejected from the sample, only companies that have 11 years of operation from 2004/05 up to 2014/15 are included in the sample. 2004/05 year data is only needed to calculate growth (percentage change of total asset) for the year 2005/2006. The second criteria was that private manufacturing firms that have full 11 years of data record are included in the sample (i.e. those manufacturing companies that have 11 years of operation but companies with one or more years of missing data record are excluded from the sample). The data were analyzed using STATA SE 14 software.

5.2 Model estimation and specification

In this study, Panel data were used to investigate the relationship between the capital structure and the firm-specific variables in Ethiopian private manufacturing sector. Panel data, also known as longitudinal, is a combination of cross-section and time-series data. Panel data allows for controlling unobservable heterogeneity for each observation contained in the sample to reduce estimation bias. Panel data is also very helpful in reducing or eliminating multicollinearity among explanatory variables.

In order to prevent model mis-specification, the most common method to detect model specification error, Ramsey omitted specification test and Link model specification test, are used in this study to estimate the regression model properly. And the result revealed that there is no problem of model

specification (i.e. the regression model is correctly specified). Based on the Hausman specification test result, random effect model is more efficient than the other two panel data methods namely, pooled OLS model and fixed effect model. Furthermore, Breusch and Pagan Lagrangian Multiplier (LM) test result suggests that random effect model is appropriate model. Random effect model assumes that the variation across entities is random and estimates the coefficients based on the assumption that the individual or group effects are uncorrelated with other independent variables. The equation of random-effect model used to explain the relationship is given below:

$$TDR_{it} = \alpha + \beta_1 AGE_{it} + \beta_2 SIZE_{it} + \beta_3 PROF_{it} + \beta_4 TANG_{it} + \beta_5 GRTH_{it} + \beta_6 LIQ_{it} + \beta_7 NDTS_{it} + \beta_8 EV_{it} + u_{it} + \epsilon_{it} \tag{1}$$

Where:

- TDR_{it} = Total debt ratio of firm *i* at time *t*; measured as $\frac{\text{Total liabilities}}{\text{Total assets}}$
- AGE_{it} = Age of firm *i* at time *t*; measured as the number of years a firm stays in the business.
- $SIZE_{it}$ = Size of firm *i* at time *t*; measured as the natural logarithm of total assets
- $PROF_{it}$ = Profitability of firm *i* at time *t*; measured as $\frac{EBIT}{\text{Total assets} - \text{Fixed assets}}$
- $TANG_{it}$ = Tangibility of firm *i* at time *t*; measured as $\frac{\text{Current Asset}}{\text{Total assets}}$
- $GRTH_{it}$ = Growth of firm *i* at time *t*, measured as $\frac{\text{Total assets}_t - \text{Total assets}_{t-1}}{\text{Total assets}_{t-1}}$
- LIQ_{it} = Liquidity of firm *i* at time *t*, measured as $\frac{\text{Current Asset}}{\text{Current Liabilities}}$
- $NDTS_{it}$ = Non- debt tax shield of firm *i* at time *t*, measured as $\frac{\text{Depreciation}}{\text{Total assets}}$
- EV_{it} = Earnings volatility of firm *i* at time *t*; measured as standard deviation of EBIT
- α = Intercept
- $\beta_1 - \beta_8$ = Coefficients of the explanatory variable respectively
- u_i = Error term that vary across entities but are constant over time
- ϵ_{it} = Error term that vary across entities and times

6. Results and Discussion

This section of the study presents the summary of descriptive statistics results by screening number of observations, mean distribution, standard deviation, minimum and maximum values of all variables used in this study, Followed by the regression result of the sample private manufacturing firms of Ethiopia.

Table 2: Summary of Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
TDR	1,120	.4504587	.1948655	.0256396	.9887949
AGE	1,120	21.24107	6.236686	10	35
SIZE	1,120	17.09489	1.688876	13.50781	22.17344
PROF	1,120	.0898703	.1574312	-.611085	.9469629
TANG	1,120	.331582	.1931617	.051948	.893526
GRTH	1,120	.14139	.4086567	-.6962426	10.1753
LIQ	1,120	3.948172	3.623192	.3727109	22.26984
NDTS	1,120	.0365531	.0295001	.0100835	.1936386
EV	1,120	1.26e+07	3.01e+07	55195	2.07e+08

Source: STATA summary output

As it can be observed from the above table 2 summary of descriptive statistics, total debt ratio (TDR) has a mean value of 45%. Total debt ratio measures the extent of a company's leverage and it indicates that on average 45% of the total asset of the sample private manufacturing companies of Ethiopia is financed by using debt. The standard deviation of total debt ratio is approximately 19.5% indicates that there is a wide variation in the sector in financing their assets using debt. The minimum amount of debt used to finance their asset is 2.6% and the maximum is 98.9%.

The first independent variable used in this study is age measured as the number of years a firm stays in the business. As Table 2 shows that the minimum track record of operation of the sample Ethiopian private manufacturing companies is 10 years while the largest track of operation is 35 years and

the approximate average age of the sample private manufacturing companies used in this study is 22 years.

As can be seen in table 3, below, the explanatory power of the model can be seen from the R squared (R-sq) value. The overall explanatory power of this model is 49.46%. This indicates that 49.46% of the change in total debt ratio, which is used as a measure of financial leverage, is successfully explained by the selected independent variables included in the model. However, the remaining 50.54% changes in total debt ratio are caused by other factors that are not included in the model. Furthermore, the overall significance of the model measured by Wald chi2 (7) with its P-value (Prob > chi2) indicates that the model is well fitted at 1% level of significance.

Table 3: Regression result of Total debt ratio

Random-effects GLS regression	Number of obs = 1,120
Group variable: CompanyID	Number of groups = 112
R-sq:	Obs per group:
within = 0.1238	min = 10
between = 0.7489	avg = 10.0
overall = 0.4946	max = 10
	Wald chi2(7) = .
corr(u_i, X) = 0 (assumed)	Prob > chi2 = .
	(Std. Err. adjusted for 112 clusters in CompanyID)

TDR	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
AGE	.0181139	.0016526	10.96	0.000	.014875	.0213529
SIZE	-.0067741	.0084307	-0.80	0.422	-.023298	.0097498
PROF	-.2057584	.0443241	-4.64	0.000	-.2926321	-.1188848
TANG	.1256918	.0417113	3.01	0.003	.0439392	.2074444
GRTH	.0488987	.0121218	4.03	0.000	.0251404	.0726569
LIQ	-.0068147	.0030633	-2.22	0.026	-.0128187	-.0008108
NDTS	-.7587692	.3576878	-2.12	0.034	-1.459824	-.0577139
EV	2.70e-10	2.24e-10	1.21	0.227	-1.68e-10	7.08e-10
_cons	.2026268	.1496378	1.35	0.176	-.0906578	.4959114
sigma_u	.06656083					
sigma_e	.12288153					
rho	.22684565					

(fraction of variance due to u_i)

Source: STATA summary output

Research Findings related to hypothesis 1

“There is significant positive relationship between age and financial leverage of a firm”

In line with the research hypothesis formulated regression result of the study exhibits statistical evidence that age of the firm is positively related with total debt ratio at 1% level of

significance. The result suggests that older firms of Ethiopian private manufacturing sector have high level of debt in their asset structure than start-up firms, due to the fact that older firms proved their performance as ongoing entity and accumulated a good reputation in the debt market. This significant positive relationship is consistent with the

prediction of trade off theory, suggests that the older the firm, the more debt it can take in, because a firm's good reputation accumulated over many years assists in borrowing more debt (Jensen and Meckling's, 1976) [26].

This research finding provides empirical support to work of Giannetti (2003) [22], Abor (2008) [11] and Ramalho and Silva (2009) [40].

Research Findings related to hypothesis 2

“There is significant positive relationship between size and financial leverage of a firm”

The research hypothesis formulated in this study is based on the trade off theory suggests that large firms have a better capacity for taking large amount of debt as compared to smaller firms. This is due to the fact that large firms are more diversified and usually face lower default risk or have lower bankruptcy risk. But in contrary to the research hypothesis formulated in this study, the regression result is found to be a negative relationship between size of the firm and total debt ratio. Even though the result found a negative relationship, which is consistent with pecking order theory, but the result is statistically insignificant. Therefore, the researcher is forced to reject both the null hypothesis as well as the alternative hypothesis. This implies that size of a firm has no any significant impact on the capital structure of Ethiopian private manufacturing sector within the scope of this analysis.

Research Findings related to hypothesis 3

“There is significant negative relationship between profitability and financial leverage of a firm”

In this study, Profitability has a significantly negative relationship with total debt ratio, which is consistent to the hypothesis formulated. This significant sign of profitability is consistent with the prediction of pecking order theory, which states that firms prefer to use internal fund rather than external fund. Therefore, the regression result indicates that Ethiopian private manufacturing firms follow the financial hierarchy of pecking order theory, in the first place companies prefer to use internal source of finance, which is usually retained from profit but in the absence of internal fund they move for debt and then equity if necessary. This implies that profitable firms of Ethiopian private manufacturing sector tend to have lower debt level because profitable firms finance their activities firstly out of retained earnings. On the other hand, non profitable firms finance their activity by using relatively higher debt level as compared to the profitable firms. Generally the regression estimation result confirmed an inverse relationship between profitability and debt ratio of Ethiopian private manufacturing sector. Therefore, the researcher accepts the null hypothesis formulated.

In agreement with study, Titman and Wessels (1988) [44], Rajan and Zingales (1995) [39], Pandey (2001) [38], Fan *et al.*, (2006) [18, 19] reported a significantly negative relationship between profitability and financial leverage. That is, high profitable firms are more likely to use internal fund, usually retained earnings, and thereby reducing their external borrowing level.

Research Findings related to hypothesis 4

“There is significant positive relationship between tangibility and financial leverage of a firm”

In this study, tangibility has a positive significant relationship with total debt ratio at 1% level of significance. This implies that Ethiopian private manufacturing companies with high possession of fixed asset have high amount of debt in their capital structure mixture. This research finding is in consistent with both pecking order theory and trade off theory. Pecking order theory suggests that, firms with high tangibility can use more debt because fixed assets have low asymmetric information costs and trade off theory suggests that firms with high composition of fixed assets are able to borrow more debt by pledging its tangible fixed assets as collateral. So tangibility of firm plays a significant role in accessing loans in the context of Ethiopian private manufacturing sector. Therefore the researcher accepts the null hypothesis.

This research work provides empirical support to the findings of Jensen and Meckling's (1976) [26], Bradley *et al.* (1984) [10, 11], Wedig *et al.* (1988) [45], Rajan and Zingales (1995) [39] and Frank and Goyal (2009) [21].

Research Findings related to hypothesis 5

“There is significant positive relationship between growth and financial leverage of a firm”

In line with the pecking order theory the regression of result found a significant positive relationship between growth and total debt ratio at 1% level of significance. This implies that growing firms of Ethiopian private manufacturing sector have high proportion of debt level in their capital structure.

The research findings provide statistical evidence that growth has a strong positive effect on the financial structure of Ethiopian private manufacturing sector. Therefore, the researcher accepts the null hypothesis.

This research work provides empirical support to the early findings of Marsh (1982) [28], Michaelas *et al.* (1999) [29], and to recent findings of Crnigoj and Mramor (2009) [13], Noulas and Genimakis (2011) [37] and Al-Najjar (2011) [2].

Research Findings related to hypothesis 6

“There is significant negative relationship between liquidity and financial leverage of a firm”

In this study, liquidity has a significant negative relationship with total debt ratio at 5% level of significance. The finding of the study is consistent with the hypothesis formulated which is based on pecking order theory. This implies that Ethiopian private manufacturing firms with high liquidity funding their activities using their current asset or accumulated internal fund before raising debt. In another words Liquidity is considered a source of internal funds, so firms will prefer to use it first before allowing for any external financing. Accordingly, the researcher accepts the formulated hypothesis, which is in consistency with the pecking order theory. This research finding provide empirical support to the early finding of Rajan and Zingales (1995) [39] and to the recent finding of De Jong *et al.* (2008) [14] and Moosa *et al.* (2011) [37].

Research Findings related to hypothesis 7

“There is significant negative relationship between non-debt tax shields and financial leverage of a firm”

In line with the research hypothesis formulated regression result of the study exhibits statistical evidence that non-debt tax shields is negatively related with total debt ratio at 5% level of significance. The negative significant relationship is in consistent with the trade off theory which suggests that, firms could reduce tax payments by using more debt rather than equity in financing their activities but in the presence of high non-debt tax shields firms could decrease their debt financing because non-debt tax shields provide alternative to interest tax shield. This implies that Ethiopian private manufacturing firms with large amount of non-debt tax shields have less debt in their capital structure. That is due to that fact that firms with high non debt tax shields are not increasing their debt financing for the purpose of tax benefit, because interest deduction of debt financing is substituted by non-debt tax shields (tax deductions for depreciation). Therefore, the researcher accepts the null hypothesis formulated.

This research finding provide empirical support to the early

findings of Scott (1977) [42], Bradley *et al.* (1984) [10, 11], Moore (1986) [33] and to the recent finding of Cortez and Susanto (2012) [12].

Research Findings related to hypothesis 8

“There is significant negative relationship between earning volatility and financial leverage of a firm”

The last hypothesis formulated in this study, based on pecking order and trade off theory, is earning volatility and both theories predict a negative relationship with financial leverage. The regression results are found to be statically insignificant with financial leverage and also it is found in contrary to the research hypothesis formulated. Therefore, the researcher rejected the null hypothesis and favoring the alternate hypothesis that assume negative relationship between earning volatility and financial leverage but the result is statistically insignificant. Accordingly, the result reveled that, earning volatility has no significant effect on the financial leverage of Ethiopian private manufacturing sector. Therefore, the researcher rejects both the null and alternative hypothesis formulated.

Table 4: Summary of the hypothesis formulated and actual result

Explanatory variable	Hypothesis sign	Predicted sign of the main capital structure theories				Dependent variable (total debt ratio)	
		POT	TOT	ACT	ST	Actual Result	Decision
AGE	(+)	(-)	(+)	?	?	(+)***	Accepted
SIZE	(+)	(-)	(+)	(+)	(+)	(-) Not significant	Rejected
PROF	(-)	(-)	(+)	(+)	(+)	(-)***	Accepted
TANG	(+)	(+)	(+)	(+)	?	(+)***	Accepted
GRTH	(+)	(+)	(-)	(-)	?	(+)***	Accepted
LIQ	(-)	(-)	(+)	?	?	(-)**	Accepted
NDTS	(-)	(-)	(-)	?	?	(-)**	Accepted
EV	(-)	(-)	(-)	?	?	(+) Not significant	Rejected

Note: (+) ⇒ Positive relationship between explanatory and dependent variable

(-) ⇒ Negative relationship between explanatory and dependent variable

? ⇒ available literature does not provide clear prediction

POT ⇒ Pecking order theory

TOT ⇒ Trade-off theory

ACT ⇒ Agency cost theory

ST ⇒ Signalling theory

*** ⇒ significant at 1%, ** ⇒ significant at 5%,

7. Conclusion

This study investigates the determinants of capital structure of Ethiopian private manufacturing sector. Accordingly, age, profitability, tangibility, growth, liquidity and non debt tax shield have statistical significant impact on the total debt ratio. This implies that firm-specific factors have a significant influence on capital structure of Ethiopian private manufacturing sector. Only Size and earning volatility are found to be in contrary to the research hypothesis formulated and the statistical result is also insignificant. Therefore size and earning volatility have no statistical significance impact on the capital structure of Ethiopian private manufacturing sector.

The regression result implies that Age, tangibility and Growth have significant positive relationship with total debt ratio. Ethiopian private manufacturing sector highly depends on equity financing in their start-up period (I.e. younger firms have less proportion of debt) but when they become older and

older they gradually increase the proportion of debt. This result supports trade off theory. Furthermore, asset tangibility or collateral value is an important factor in accessing debt financing for Ethiopian private manufacturing sector. This result supports both pecking order theory and trade off theory. In addition, growing firms of Ethiopian private manufacturing firms use more debt financing which is consistent with pecking order theory.

On the other hand, the regression result reveled that profitability, liquidity and non debt tax shield have significant negative relationship with total debt ratio. Profitable Ethiopian private manufacturing firms prefers to use internal fund which is usually retained from profit (i.e. profitable firms have less debt proportion), which supports pecking order theory. In addition, highly liquid Ethiopian private manufacturing firms have less proportion of debt because current assets are considered as an internal source of finance. This result supports pecking order theory. At last, private manufacturing

firms with high non debt tax shield have less proportion of debt. This implies that deductions allowed by depreciation substitutes the role of tax savings acquired through the use of debt, which is in consistent with trade off theory.

As it can be observed from the above discussion and table 4, pecking order theory, trade off theory and agency cost theory have their own contribution on the capital structure of Ethiopian private manufacturing sector but mainly Ethiopian private manufacturing sector follows pecking order theory. This indicates that they are highly dependent on internal source of financing. This is also an indication of either there is high cost of debt financing or access to debt finance is difficult. But Private manufacturing firms with a growing opportunity can further look debt financing as their internal source is not sufficient. Furthermore, collateral is an important feature of debt contracts in case of Ethiopian Private manufacturing firms.

8. References

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