Chapter 8
Firm-Specific Determinants of Insurance Companies' Capital Structure in Ethiopia

Yitbarek Takele and Daniel Beshir

Abstract This study examines the impact of firm-specific characteristics on capital structure (CS) decisions of the Ethiopian insurance industry. The study used panel-fixed effects robust standard error regression models, the DEBT model, and the DE model using financial statements of eight insurance companies covering the period from 2005 to 2014. To validate the results, it conducted normality, multi-collinearity, heteroskedasticity, autocorrelation, and robustness tests. We found pecking order, static trade-off, and agency cost theories as the most important in explaining CS decisions of insurance companies in Ethiopia though the pecking order theory appeared to be dominant. The empirical findings of the models indicate that profitability and liquidity are significant in determining Ethiopian insurance companies' financing decisions, while business risk and size of the firm are insignificant in shaping their behavior. On the other hand, firms' asset tangibility and growth opportunities had a significant impact on the total debt ratio, while these factors were insignificant for the debt–equity ratio.

Keywords Ethiopia · Capital structure · Firm-specific · Insurance · Leverage

8.1 Introduction

Capital structure (CS) is a mix of long-term debt, specific short-term debt, common equity, and preferred equity. It shows how a firm finances its overall operations and growth by using different sources of funds. While looking at what constitutes CS, debt comes in the form of bond issues or long-term notes payable and equity as common stock, preferred stock, or retained earnings. It is in insurance companies'

Y. Takele (✉)
College of Business and Economics, Addis Ababa University,
Addis Ababa, Ethiopia
e-mail: yitbarekt87@gmail.com

D. Beshir
Libya Oil Ethiopia Ltd, Addis Ababa, Ethiopia

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interest to know about their CS patterns as they need funds to settle claims or pay damages at the time of loss. This helps insurance companies to be sustainable because of the nature of risks involved in their businesses and the inherent impracticality of retaining all risks that they face during operations.

The paper is structured as follows. Section 8.2 gives a brief overview of the Ethiopian insurance sector. Section 8.3 discusses major theoretical underpinnings of the subject. The next section addresses the link between theoretical lenses and the variables chosen along with empirical reviews and the conceptual framework. Section 8.5 explains the relationship among the variables, the methodology, and data, while Sect. 8.6 analyzes the empirical results. Section 8.7 gives a conclusion.

The determinants of CS have been debated for many years and still represent one of the unresolved issues in the corporate finance literature. Though a few of the theories that have been developed have been empirically tested, their findings have led to different, anomalous, and sometimes conflicting results and conclusions. This also suggests that the different theories are not mutually exclusive making the debates on CS more exciting (Rajan and Zingales 1995). Moreover, Morri and Beretta (2008) emphasize the lack of a fully supported and commonly accepted theory of CS decisions and the unfolding nature of its determinant factors.

The different studies have made immense contributions to the theory of CS. However, these studies are inclined toward the developed economies, and less developed countries have received little attention. This has raised concerns about the generalizability of such works, for example, where capital markets are not well developed or are underdeveloped. Consequently, research designs, methodologies, and theoretical frameworks that best fit such contexts are worth undertaking. In previous studies, antecedent variables, commonly regarded as determinants of CS decisions, include profitability, age, agency cost, business risk, asset tangibility, growth, non-debt tax shields, liquidity, political risks, and size. These variables, among others, are related to firm value and risk exposure in one way or another.

Our study, therefore, investigates the determinants of decisions about CS in the insurance industry in Ethiopia during 2005–2014. Our research identified six hypotheses (H_{ai}):

H_{a1}: There is a negative relationship between leverage and profitability in Ethiopian insurance companies.
H_{a2}: There is a positive relationship between leverage and asset tangibility in Ethiopian insurance companies.
H_{a3}: There is a positive relationship between leverage and growth in Ethiopian insurance companies.
H_{a4}: There is a negative relationship between leverage and business risk in Ethiopian insurance companies.
H_{a5}: There is a positive relationship between leverage and size of the firm in Ethiopian insurance companies.
H_{a6}: There is a negative relationship between leverage and liquidity in Ethiopian insurance companies.

8.2 An Overview of the Insurance Industry in Ethiopia

The emergence of modern insurance in Ethiopia can be traced back to the establishment of the Bank of Abyssinia in 1905. The bank acted as an agent for foreign insurance companies to underwrite fire and marine policies. The first domestic private insurance company was established in 1951 with a share capital of Eth Br 1,000,000, and in the 1960s, the number of domestic private companies was started increasing (Zeleke 2007).

At present, there are 15 insurance companies that are operational in Ethiopia that provide general insurance services, except one, which provides life insurance. One of the insurance companies, the Ethiopian Insurance Corporation (EIC), is state-owned, while the rest are private. Ethiopian insurance companies' investment activities are heavily constrained by the restrictions imposed by the National Bank of Ethiopia's investment proclamation which requires them to invest a majority of their funds in government securities and bank deposits at negative real interest rates. Moreover, lack of infrastructure, especially a stock market, has constrained investment activities of Ethiopian insurance companies (Mezgebe 2010). Following this, competition has become stiff in the industry and some of the private insurance companies that want to increase their sales volumes have been granting unfair and huge discounts to attract clients, thus attaining sales targets. This aggressive pricing policy has led to an unhealthy spiral of premium cutting which significantly undermines the growth and prospects of the insurance industry in Ethiopia.

8.3 Theoretical Underpinnings

Since the publication of Modigliani and Miller's (1958) 'irrelevance theory of capital structure,' the theory of corporate CS has been a study of interest for finance economists. Researchers of this study believe the relevance of CS arguments and theories that take into account market imperfections as witnessed in the 2008 financial crisis. Researchers also hold the assumption that it is possible to find an 'optimal' CS after accounting for market imperfections such as taxes, bankruptcy, and agency costs. In their later work, Modigliani and Miller (1963) considered some of the criticisms and deficiencies of their theory and relaxed the assumption that neglected corporate taxes.

Major theories of CS have emerged that diverge from the assumption of perfect capital markets in which the 'irrelevance model' is promoted. The first in the irrelevance model is the trade-off theory. The original version of the trade-off theory grew out of a debate over the Modigliani–Miller theorem. When corporate income tax was added to the original irrelevance theory, it validated the use of debt as it provides a tax shield. It proposes that optimal CS is achieved when the marginal present value of the tax shield on additional debt is equal to the marginal present value of the financial distress cost on additional debt (Myers 1984).

The dynamic trade-off theory, on the other hand, recognizes the role of time that requires specifying a number of aspects that are typically ignored in a single-period model. Of particular importance are the roles of expectations and adjustment costs. In a dynamic model, the correct financing decision typically depends on the financing margin that a firm anticipates in the next period (Goldstein et al. 2001). Thus, an optimal financial choice today depends on what is expected to be optimal in the next period.

Agency cost is another theory that predicts that CS choice is dependent on agency cost. It advocates an investigation of the conflicting interests of managers and equity and debt holders and its impact on CS decisions. It argues that managers who are well placed to access superior information as compared to both debt and equity holders, mainly due to ex-post asymmetric information (Jensen and Meckling 1976; Jensen 1986), may make CS decisions that maximize their interests but destroy the firm's value.

Yet another interesting theory is the pecking order theory developed by Myers and Majluf (1984) which states that CS is driven by a firm's desire to finance new investments, first internally and then with low-risk debt and finally, if all fails, with equity. Its main thesis is an association of asymmetric information and signaling problems with external financing.

Finally, Baker and Wurgler (2002) have suggested another theory of CS: the 'market timing theory of CS.' Market timing implies that firms issue new shares when they perceive they are overvalued and that firms repurchase their own shares when they consider these to be undervalued.

What we can deduce from these theories is that they are not mutually exclusive and do not stand on their own; rather, there exists a thread connecting them: information asymmetry. The exception to this could be the trade-off theory which mainly bases itself on tax shield advantages and bankruptcy costs.

8.4 Empirical Review and Conceptual Framework

By summarizing previous studies, profitability, tangibility, growth, risk, size, and liquidity of assets were selected and included as explanatory variables in our study and a firm's CS (leverage) was used as the dependent variable. Though there are different measures of leverage, our paper used two ratios as a proxy of leverage. The first was the debt ratio (total debt to total assets), and the second was the debt–equity ratio (debt to equity). In both these, total debt was calculated as the sum of short-term and long-term liabilities.

The pecking order theory (Myers 1984) argues that profitable firms with access to retained profits can rely on them as opposed to outside sources such as debt. On the other hand, the static trade-off theory (Myers 1984; Myers and Majluf 1984) provides a contradictory view and argues that profitable firms have greater needs to shield income from corporate tax to increase profits and should borrow more as compared to less profitable firms. In contrast to Myers and Majluf (1984) and

Myers' (1984) views, empirical evidence from financial and non-financial firms (Ahmed et al. 2010; Gill et al. 2009; Najjar and Petrov 2011; Rajan and Zingales 1995; Sharif et al. 2012; Teker et al. 2009) found that profitable firms used less debt financing in line with the pecking order theory, while studies by Kumar et al. (2012) and Sayeed (2011) found that profitable firms used more debt finance. As a proxy for the measure of profitability, our study used the ratio of operating income to total assets (return on assets) used by Booth et al. (2001), Cassar and Holmes (2003), Mohammed Amidu (2007), and Adesola (2009).

According to Jensen and Meckling's (1976) agency cost theory, there is a conflict between lenders and shareholders due to the possibility of moral hazard on the part of borrowers. This conflict creates incentives for shareholders to invest in a suboptimal way, and lenders require tangible assets as collateral to protect themselves. The agency cost of debt increases when firms cannot collateralize their debts. The outsized proportion of a firm's assets can be used as collateral to fulfill lenders' requirements. In the trade-off theory, Modigliani and Miller (1963) argue a reduction in financial distress costs for those firms with more tangible assets because of a better chance to get debt financing. Empirical studies by Najjar and Petrov (2011); Noulas and Genimaks (2011); Rajan and Zingales (1995); and Titman and Wessels (1988) found that firms with more proportion of tangible assets raised more debt using the same as collateral. As indicated in the studies by Mohammed Amidu (2007) and Adesola (2009), our study also used the ratio of fixed assets over total assets as a proxy measure of tangibility.

The pecking order theory argues that firms prefer debt financing over equity due to its riskiness, and hence, a positive relationship between leverage and growth is expected. However, in the static trade-off theory, growing firms face financial distress and prefer to use equity financing. Empirical studies by Ahmed et al. (2010); Noulas and Genimaks (2011); Kumar et al. (2012); and Sharif et al. (2012) have found that growing firms used more debt to finance their businesses. Contrary to this, studies by Rajan and Zinglas (1995); Shah and Khan (2007); and Titman and Wessels (1988) show that growing firms used equity financing instead of debt. In our study, sharing the argument given by Dawood et al. (2011) and Onaolapo and Kajola (2010) growth was measured as annual percentage change in total assets.

The static trade-off theory (Myers 1984) argues that risky firms can borrow less as compared to less risky firms because the costs of financial distress offset the tax shields of debt. The riskier a firm, the greater the chance of defaulting and being exposed to such costs. That is, high-volatile earning firms face a risk of the earnings level dropping below their debt servicing commitments, thereby incurring higher costs of financial distress. Hence, such firms should reduce their leverage levels to avoid the risk of bankruptcy. As indicated in Song (2005), income variability is a measure of business risk. In our study, it is measured as the ratio of the standard deviation of operating income over total assets.

Theoretically, the static trade-off theory states that for large companies the risk of bankruptcy is minimized due to the economies of scale. The assets of a company will be financed more through debt, as optimality of CS can be reached by

balancing the benefits and costs of debt (Modigliani and Miller 1958). The empirical results of Ahmed et al. (2010); Kumar et al. (2012) and Najjar and Petrove's (2011) studies support the argument that the size of a firm and its leverage are positively related. According to the pecking order theory, however, informational asymmetry for large firms is smaller, and as a result, they prefer to be financed by equity instead of debt (Myers and Majluf 1984) because this reduces the chances of undervaluation of the new issued equity and thus encourages the large firms to use equity financing. In our study, such as Booth et al. (2001) and Cassar and Holmes (2003), the natural log of total assets is used to measure the size of the firm.

There are two different opinions about the association between liquidity and CS. The first view, as explained in the trade-off theory, argues that firms with more liquidity tend to use more external borrowings because of their ability to pay off their liabilities. On the contrary, the pecking order theory believes that firms with financial slack will prefer internal sources than debt or equity to finance future investments (Myers 1984). Most previous studies confirm the negative relation. Harris and Raviv (1991); Najjar and Petrov (2011); and Sharif et al. (2012) found that firms with high liquidity ratios or more liquid assets preferred using these assets to finance their investments and discouraged raising external funds (either equity or debt). But Bayeh found an insignificant effect of liquidity on leverage usage by insurance companies. But Bayeh found an insignificant effect of liquidity on leverage usage by insurance companies. Like Dawood et al. (2011) in our study also, the ratio of current assets to current liabilities was used to capture liquidity (see Table 8.1).

8.5 Data and Methodology

Our study used the quantitative research approach to construct an empirical model. Multiple regression analyses were used to measure the effects of the determinants on the output variable and to examine the associative relationships between variables in terms of the relative importance of the independent variables and predicted values of the dependent variables.

Our study used secondary data from annual reports of insurance companies and the National Bank of Ethiopia (NBE). As per NBE's current information, 15 insurance companies are operating in the country. Since there are only a few insurance companies, there was no need to take a sample from them. Accordingly, based on the years of service, audited financial data of those insurance companies which were operational in 2005–2014 were included in our study. The reason behind selecting the stated period was to obtain strongly balanced data for the analysis. In order to make the panel data model structured and balanced, the same regular frequency of the cross-sectional data with the same start and end dates was maintained. Six insurance companies did not have the required data for the period and were excluded from the sampling frame. Moreover, one insurance company is

Table 8.1 Measurement of independent variables and expected relationships

Variable	Measurement proxy used for this study	Theoretical relationship with leverage	Theories	Expected relationship with leverage
Profitability (PF)	Operating income/total assets	(+)	Static trade-off theory	(−)
		(−)	Pecking order theory	
Tangibility of assets (TN)	Fixed asset/total assets	(−)	Agency cost theory	(+)
		(+)	Static trade-off theory	
Growth (GR)	Annual change in total assets	(+)	Pecking order theory	(+)
		(−)	Static trade-off theory	
Risk (RK)	Standard deviation of operating income	(−)	Static trade-off theory Pecking order theory	(−)
Firm size (SZ)	Natural logarithm of total assets	(+)	Static trade-off theory	(+)
		(−)	Pecking order theory	
Liquidity (LQ)	Current asset/current liability	(+)	Static trade-off theory	(−)
		(−)	Pecking order theory	

Source Own summary

government-owned and so was excluded as it was not possible to obtain complete audited financial statements for the whole period. Finally, 10 consecutive years' information and data from eight insurance companies for 2005–2014 were used in our study.

The general model for this study is presented as follows:

$$Y_{i,t} = \beta_0 + \beta X_{i,t} + \varepsilon_{i,t}$$

The subscript i represents the cross-sectional dimension, and t denotes the time series dimension. The left-hand side in the equation, $Y_{i,t}$, represents the dependent variable in the model, which is a firm's leverage. On the right side, $X_{i,t}$ represents

the set of independent variables in the estimated model. Therefore, the expanded forms of both models built in line with the hypothesis of the study are as follows:

DEBT model: debt ratio (total debt/total asset) as the dependent variable

(1) $TD/TA_{it} = \beta_0 + \beta_1(PF_{it}) + \beta_2(TN_{it}) + \beta_3(GR_{it}) + \beta_4(RK_{it}) + \beta_5(SZ_{it}) + \beta_6(LQ_{it}) + \varepsilon$ DE Model: debt–equity ratio as the dependent variable

(2) $D/E_{it} = \beta_0 + \beta_1(PF_{it}) + \beta_2(TN_{it}) + \beta_3(GR_{it}) + \beta_4(RK_{it}) + \beta_5(SZ_{it}) + \beta_6(LQ_{it}) + \varepsilon$

where

TD/TA	Total debt to total assets
D/E	Debt to equity
PF	Profitability
TN	Tangibility
GR	Growth
RK	Risk
SZ	Size of the firm
LQ	Liquidity
ε	Error term

The models were tested for the classical linear regression model's (CLRM) assumptions. Accordingly, Shapiro–Wilk, the correlation matrix, and Breusch–Pagan tests were conducted to test normality, multi-collinearity, and heteroskedasticity, respectively. We found no multi-collinearity problem which would exist if the correlation between the two independent variables was more than 0.75 (Malhotra 2008). Moreover, Shapiro–Wilk showed that normality had been established. See Annexure 2 for diagnostic tests.

We used the regression models and applied different tests (Breusch and Pagan Lagrangian multiplier (LM) test, Hausman test) to choose the best model for the panel data under the study:

- Pooled OLS (POLS) model regression,
- Pooled OLS with dummy variable (least square dummy variable: LSDV) model regression or fixed effects regression model, and
- Random effects GLS (generalized lease square) model regression.

8.6 Results and Discussion

Before explaining the results of the regression analysis, the results of the descriptive statistics and Pearson's correlation coefficient matrix are briefly explained.

The mean of debt ratio (total debt to total assets) of the 80 observations was 66.8% with a standard deviation of 8.3% indicating that more than 66% of the balance sheets of insurance companies in Ethiopia were debt-financed, while the mean debt ratio in the USA and in the UK is 58 and 54%, respectively (Rajan and

Table 8.2 Descriptive summary statistics

Variable	Obs.	Mean	Std. dev.	Min	Max
TD/TA	80	0.668	0.083	0.453	0.822
D/E	80	0.755	0.405	−0.189	1.669
gro	80	0.231	0.157	−0.066	0.670
tang	80	0.194	0.110	0.026	0.542
pr	80	0.082	0.049	−0.047	0.182
risk	80	0.141	0.099	0.025	0.432
size	80	18.914	0.843	16.965	20.294
lq	80	1.022	0.264	0.543	2.306

Source Structured review of annual financial report (generated from STATA)

Zingales 1995) (Table 8.2). Though theoretically it is argued that firms in developed countries are levered as compared to their developing country counterparts mainly due to their well-developed bond markets, the findings of our study show otherwise. This could be related to the absence of stock markets in developing country which makes equity financing more unattractive. What is interesting about the descriptive statistics of our results is the presence of high variability in the growth, tangibility, size, and liquidity of insurance companies in Ethiopia which may stress the need to consolidate the sector through mergers and acquisitions.

8.6.1 Model Selection

Annexure 1 presents all model selection tests including the results for the POLS model regression, the fixed effects (or LSDV) regression model, and the random effects model regression. We used the Breusch and Pagan Lagrangian multiplier (LM) test to decide between random effects and POLS and the Hausman test to decide between random effects and fixed effects models.

The results of Breusch and Pagan LM test for the DEBT model revealed that there was very strong evidence (p-value 0.0006) at the 1% level of significance against the null hypothesis; POLS is appropriate. This result suggests the random effects model's estimation over the pooled OLS model. The same LM test for the DE model showed indifference between POLS and the random effects model's estimations. Moreover, the results of the Hausman test showed very strong evidence (p-value 0.0085 for the DEBT model and p-value 0.0012 for the DE model) against the null hypothesis at the 1% level of significance suggesting fixed effects estimates rather than random effects estimates. Accordingly, the analysis and discussion of results are based on the fixed effects estimates.

In order to make the fixed effects estimation results robust, the modified Wald group-wise heteroskedasticity test in the fixed effects regression model was undertaken. The results for both the DEBT and DE models revealed very strong

evidence (p-value 0.0000) against the null hypothesis of homoscedasticity. Hence, there was group-wise heteroskedasticity in fixed effects regression in both the models. Accordingly, a robust standard error estimation in the fixed effects model was used to tackle the group-wise heteroscedasticity problem of the fixed effects estimates in both the models.

8.6.2 Estimation Results of the DEBT Model with a Robust Standard Error in Fixed Effects

The results of the fixed effects model with a robust standard error regression for the DEBT model are presented in Table 8.3. The results show that asset tangibility, profitability, risk, and liquidity had a negative relation with debt ratio, while growth and firm size had a positive association with leverage. The results also indicate that growth and tangibility were statistically significant at 5%. Moreover, profitability and liquidity were significant at 1%, while risk and firm size were insignificant. In

Table 8.3 Fixed effects estimates with a robust standard error for the DEBT model's regression

Fixed effects (within) regression: DEBT MODEL				Number of obs.		80	
Group variable: ID				Number of groups		8	
R^2	Within	0.7165		Obs. per group: min		10	
	Between	0.8782		avg		10.0	
	Overall	0.7918		max		10	
				F (6,7)		1792.72	
cor $(\mathbf{u_i}, \mathbf{xb})$		0.4602		Prob > F		0.0000	
			(Std. Err. adjusted for 8 clusters in ID)				
lev	Coeff.	Robust std. err.	T	$p > \|t\|$	[95% conf. Interval]		
gro	0.757	0.022	3.44	0.011	0.024	0.128	
tang	−1.366	0.045	−3.04	0.019	−0.243	−0.030	
Pr	−0.583	0.100	−5.80	0.001	−0.821	−0.345	
risk	−0.319	0.198	−1.61	0.151	−0.787	0.148	
size	0.016	0.024	0.68	0.521	−0.014	0.074	
lq	−0.120	0.016	−7.61	0.000	−0.157	−0.083	
_cons	0.582	0.490	1.19	0.274	−0.577	1.741	
Sigma$_u$	0.032						
Sigma$_e$	0.029						
rho	0.554	(Fraction of variance due to $\mathbf{u_i}$)					

Source Structured review of annual financial report (generated using STATA)

addition, the value of R^2-within = 0.7165 and adjusted $R^2 = 0.6931$ for the DEBT model. Hence, 69.31% of the variability in leverage is explained by selected firm-specific factors.

8.6.3 Estimation Results of DE Model with a Robust Standard Error in Fixed Effects

The results of the fixed effects model with a robust standard error regression for the DE model are given in Table 8.4. The results show that profitability, risk, and liquidity had a negative relation with the debt–equity ratio, while asset tangibility, growth, and firm size had a positive association with the debt–equity ratio. The results also indicate that only profitability and liquidity were statistically significant at 5%. The other explanatory variables were insignificant. In this model, the value of R^2-within was 0.5199 and adjusted R^2 was 0.4804. This shows that only 48% of the variability in the debt–equity ratio is explained by selected firm-specific factors.

Table 8.4 Fixed effect estimates with a robust standard error for the DE model regression

Fixed effects (within) regression: DE MODEL				Number of obs.		80	
Group variable: ID				Number of groups		8	
R^2	Within	0.5199		Obs. per group: min		10	
	Between	0.7077		avg		10.0	
	Overall	0.6022		max		10	
				F (6,7)		74.13	
cor ($\mathbf{u_i}$, **xb**)		0.2470		Prob > F		0.0000	
			(Std. Err. adjusted for 8 clusters in ID)				
lev	Coeff.	Robust std. err.	t	$p > \|t\|$	[95% conf. interval]		
gro	0.283	0.189	1.49	0.179	−0.165	0.731	
tang	0.061	0.731	0.08	0.936	−1.669	1.791	
Pr	−2.128	0.569	−3.74	0.007	−3.475	−0.781	
risk	−0.802	0.803	−1.00	0.351	−2.700	1.096	
size	0.220	0.114	1.93	0.095	−0.050	0.490	
lq	−0.345	0.116	−2.98	0.020	−0.619	−0.072	
_cons	−2.848	2.192	−1.30	0.235	−8.032	2.336	
Sigma$_u$	0.179						
Sigma$_e$	0.215						
rho	0.410	(Fraction of variance due to $\mathbf{u_i}$)					

Source Structured review of annual financial report (generated using STATA)

8.7 Discussion of Results

8.7.1 Profitability and Leverage

H_{a1}: There is a negative relationship between leverage and profitability in Ethiopian insurance companies.

The results of the fixed effects model with a robust standard error for both models indicated that profitability had a negative relationship with leverage, and highly significant (p-value = 0.001 for the DEBT model; and p-value = 0.007 for the DE mode). Thus, the null hypothesis is rejected, and the alternative is supported. The results are consistent with the pecking order theory which argues that profitable firms with access to retained profits can rely on internal sources instead of external ones. Moreover, the negative association between profitability and leverage is in line with the pecking order and agency theories. It also supports the findings of Rajan and Zingales (1995) and Cassar and Holmes (2003) but contradicts the static trade-off theory (Myers 1984; Myers and Majluf 1984) which argues that profitable firms have greater needs to shield their incomes from corporate tax to increase their profits and should borrow more as compared to less profitable firms.

8.7.2 Asset Tangibility and Leverage

H_{a2}: There is a positive relationship between leverage and asset tangibility in Ethiopian insurance companies.

A priori positive relationship was hypothesized and expected between tangibility and leverage. The results of the DE model show that tangibility had a positive but insignificant impact on leverage. The results indicate that the Ethiopian insurance sector holds less fixed assets and relies less on debt financing. Nonetheless, the positive correlation is in line with the static trade-off and pecking order theories.

On the other hand, the DEBT model's results showed that tangibility had a negative relationship and a significant (p-value = 0.019) impact on leverage. Consistent with the findings of previous studies (Ebru 2011), the relationship between tangibility and short-term debt was negative and significant. With respect to short-term debt, it is generally expected that firms tend to match the maturity of their debts with assets. This means that firms with more fixed assets rely more on long-term debt, while those with more contemporary assets depend more on short-term financing (Abor 2005).

The negative relationship between tangibility and leverage in our study conforms with the agency cost theory though it is not consistent with the findings of Hassan (2011); Najjar and Petrov (2011); Noulas and Genimaks (2011); Rajan and Zingales (1995); and Titman and Wessels (1988) who found that firms with a higher proportion of tangible assets used more debt using it as collateral.

8.7.3 Growth and Leverage

H_{a3}: There is a positive relationship between leverage and growth in Ethiopian insurance companies.

The results of the relationship between growth and leverage for both the DEBT and DE models' regressions show a positive association. The finding of a positive association could be for the reason that growing insurance firms rely more on external borrowings to seize market opportunities. This argument is supported by the pecking order theory.

Growth opportunities for insurance companies exhibit a significant (p-value = 0.011 for the DEBT model) impact on the debt ratio. The probable reason could be that growing insurance companies need to expand their branches to reach additional customers prompting them to absorb more debt. This finding is in conformity with Ahmed et al. (2010); Kumar et al. (2012); Noulas and Genimaks (2011); and Sharif et al.'s (2012) studies who found that growing firms were mainly financed by debt.

However, the results obtained from the DE model regression show that there exists no significant relationship (p-value = 0.179 for the DE model) between expected growth and the debt-to-equity ratio. This finding is in conformity with studies by Hassen (2011); Najjar and Petrove (2010); Olayinka (2011); Rajan and Zinglas (1995); Shah and Khan (2007); and Titman and Wessle (1988) which showed that growing firms were financed more by equity instead of debt. This positive insignificant result indicates that growth is not considered a proper explanatory variable of leverage in the Ethiopian insurance sector. One possible explanation could be that the measure used in our study, the percentage change in total assets, did not reflect future growth possibilities enough. Thus, other more significant results might be obtained by using another measure (proxy) for growth, for instance annual change in sales or the market-to-book ratio. In addition, the adjusted R^2 for the DE model's regression revealed that only 48% of the variability in the debt–equity ratio was explained by the selected firm-specific variables in our study.

8.7.4 Risks and Leverage

H_{a4}: There is a negative relationship between leverage and business risk in Ethiopian insurance companies.

Business risks are insignificant for both the DEBT model (p-value = 0.151) and the DE model (p-value = 0.351) in explaining CS decisions of Ethiopian insurance companies. This result contradicts Kindie (2011) and Solomon's (2012) studies. However, it is in line with the argument of the trade-off theory which suggests that less risky insurance firms can take more debt as their ability to pay interest payments without delay is reliable. The results of both the models are also in line with the pecking order theory, which predicts a negative relationship between leverage and the earning volatility of a firm.

8.7.5 Size of the Firm and Leverage

H_{a5}: There is a positive relationship between leverage and the size of a firm in Ethiopian insurance companies.

The size of the insurance firms is insignificant in explaining capital decision behaviors for both the DEBT model (p-value = 0.521) and the DE model (p-value = 0.095) at the 5% significance level. The reason could be that lending organizations give less emphasis to the size of the firm while performing a credit risk analysis. However, the results of both the models confirm that the size of an Ethiopian insurance company positively affected leverage even if it was insignificant. This is in line with the trade-off and agency theories and is similar to Rajan and Zingales (1995) and Kindie (2011).

8.7.6 Liquidity and Leverage

H_{a6}: There is a negative relationship between leverage and liquidity in Ethiopian insurance companies.

For both models, liquidity had a negative relationship with leverage and was significant (p-value = 0.000) for the DEBT model and (p-value = 0.020) for the DE model at the 5% significance level. This negative strong significant relationship implies that Ethiopian insurance firms with liquid assets such as cash and marketable securities prefer internal sources than debt or equity to finance future investments which are consistent with the pecking order theory. The results, however, contradict the trade-off theory, which argues that firms with more liquidity tend to use more external borrowings because of their ability to pay off their liabilities. The results also deviate from Kindie's (2011) empirical study.

8.8 Conclusion and Future Research Direction

The empirical findings of both the models indicate that profitability and liquidity were significant in determining Ethiopian insurance companies' financing decisions, while business risk and size of a firm were found to be insignificant in shaping the behavior of the firm. On the other hand, asset tangibility and growth opportunities for firms had a significant impact on the total debt ratio. However, these factors were insignificant for the debt–equity ratio. Insurance companies in Ethiopia rely on short-term debt due to the absence of a stock market in the country. They also depend more on external borrowings to expand their markets.

Based on previous studies and an extensive literature review, the major theories of CS including the static trade-off theory, the pecking order theory, and the agency

theory were selected and an attempt was made to identify the theory that best explained the financial decision behavior of insurance companies in Ethiopia. The results revealed that pecking order, information asymmetry, and the static trade-off theories were all important in explaining the CS of insurance companies in Ethiopia, even if the pecking order theory appeared to be dominant.

Considering the current growth opportunities for insurance companies in Ethiopia, internal sources of funding might not be enough. Therefore, it is advisable not to depend only on internal sources of funds. Having a reasonable proportion of long-term debt in CS is considered a priority for growth in developing countries as this helps them utilize available market opportunities. Moreover, the industry should keep in touch with the trade-off theory since it has strong practical appeal; it rationalizes moderate debt ratios and sets a target debt-to-equity ratio.

Future Research Direction

Macroeconomic factors (such as inflation, GDP, and interest rate), other qualitative factors (management quality of each insurance company, policies, and procedures), and the ownership structures of the companies which might have an impact on CS choice and the effect of regulation on solvency and CS of insurance companies are recommended as area for further research. Moreover, there is a need to thoroughly study why pecking order happens to be the dominant theory in explaining the financing behavior of insurance companies in Ethiopia.

Annexure 1: Model Selection

POLS model regression, fixed effects (or LSDV) regression model, and the random effects model regression results of the DEBT model regression

Variable	POLS	LSDV	Fixed effects	Random effects
gro	0.119***	0.076**	0.076**	0.089***
tang	−0.280***	−0.137*	−0.137*	−0.204***
pr	−0.755***	−0.583***	−0.583***	−0.645***
Risk	−0.409***	−0.319**	−0.319**	−0.328***
size	0.003	0.014	0.014	0.015
lq	−0.183***	−0.120***	−0.120***	−0.147***
ID				
2		−0.015		
3		−0.65*		
4		0.014		
5		−0.019		
6		−0.489***		

(continued)

(continued)

Variable	POLS	LSDV	Fixed effects	Random effects
7		−0.073***		
8		−0.0566**		
_cons	0.949***	0.615*	0.582	0.651**
N	80	80	80	80

Note *$p < 0$ 0.05; **$p < 0.01$; ***$p < 0.001$
Source Structured review of annual financial report (generated using STATA)

POLS model regression, fixed effects (or LSDV) regression model, and the random effects model regression results of the DE model regression

Variable	POLS	LSDV	Fixed effects	Random effects
gro	0.496*	0.283	0.283	0.496*
tang	−0.833**	0.061	0.061	−0.833**
pr	−3.220***	−2.128**	−2.128**	−3.220***
Risk	−1.530**	−0.802	−0.802	−1.530**
size	0.119	0.220	0.220	0.119
lq	−0.674***	−0.345*	−0.345*	−0.674***
ID				
2		−0.157		
3		−0.335		
4		−0.099		
5		0.093		
6		−0.189		
7		−0.467***		
8		−0.244		
_cons	−0.273	−2.673	−2.673	−0.273
N	80	80	80	80

Legend *$p < 0$ 0.05; **$p < 0.01$; ***$p < 0.001$
Source Structured review of annual financial report (generated using STATA)

Breusch and Pagan LM test for DEBT model

Breusch and Pagan Lagrangian multiplier test for random effects: DEBT model		
lev [ID, *t*] = *xb* + *u*[ID] + *e*[ID, *t*]		
Estimated results:		
	Var	sd = sqrt (var)
lev	0.0069	0.0832
e	0.0008	0.0291
u	0.0003	0.0180
Test: var (*u*) = 0		
$\mathbf{Chi^2(01)} = 10.63$		
$\mathbf{prob > Chi^2} = 0.0006$		

Source Structured review of annual financial report (generated using STATA)

Breusch and Pagan LM test for DE Model

Breusch and Pagan Lagrangian multiplier test for random effects: DE model		
lev[ID, *t*] = *xb* + *u*[ID] + *e*[ID, *t*]		
Estimated results:		
	var	sd = sqrt (var)
lev	0.164	0.405
e	0.046	0.215
u	0	0
Test: var(u) = 0		
$\mathbf{Chi^2(01)} = 0.00$		
$\mathbf{prob > Chi^2} = 1.0000$		

Source Structured review of annual financial report (generated using STATA)

Hausman LM test for DEBT model

Coefficients				
	(*b*)	(*B*)	(*b* − *B*)	Sqrt (diag(*v_b* − *v_B*))
	Fixed effects	Random effects	Difference	S.E
gro	0.076	0.089	−0.13	.
tang	−0.137	−0.206	0.069	0.370
pr	−0.583	−0.645	0.062	0.014

(continued)

(continued)

Coefficients				
	(*b*)	(*B*)	(*b* − *B*)	Sqrt (diag(*v_b* − *v_B*))
	Fixed effects	Random effects	Difference	S.E
risk	−0.319	−0.329	0.087	0.067
size	0.016	0.015	0.001	0.009
lq	−0.120	−0.147	0.027	0.012
b = consistent under H_0 and H_a; obtained from xtreg				
B = inconsistent under H_a *and* efficient under H_0; obtained from xtreg				
Test: H_0 : difference in coefficiens not systematic				
$Chi^2(6) =$	$(b - B)'[(v\_b - v\_B) \wedge (-1)] (b - B)$			
=	17.21			
prob > Chi^2 =	0.0085			

Source Structured review of annual financial report (generated using STATA)

Hausman LM test for DE Model

	Coefficients			
	(*b*)	(*B*)	(*b* − *B*)	Sqrt (diag(*v_b* −*v_B*))
	Fixed effects	Random effect	Difference	S. E
gro	0.283	0.496	−0.213	.
tang	0.061	−0.834	0.893	0.358
pr	−2.128	−3.222	1.094	0.329
risk	−0.802	−1.530	0.728	0.639
size	0.220	0.119	0.102	0.0903
lq	−0.345	−0.674	0.329	0.115
b = consistent under H_0 and H_a; obtained from xtreg				
B = inconsistent under H_a and efficient under H_0; obtained from xtreg				
Test: H_0 : difference in coefficiens not systematic				
$Chi^2(6) =$	$(b - B)'[(v\_b - v\_B) \wedge (-1)] (b - B)$			
=	22.10			
prob > Chi^2 =	0.0012			

Source Structured review of annual financial report (generated using STATA)

Modified Wald test for group-wise heteroscedasticity in fixed effects regression: DEBT model

H_0 : sigma$(i)^2$ = sigma^2 for all i
$Chi^2(8) = 49.00$
prob > $Chi^2 = 0.000$

Source Structured review of annual financial report (generated using STATA)

Modified Wald test for group-wise heteroscedasticity in fixed effects regression: DE model

H_0 : sigma$(i)^2$ = sigma^2 for all i
$Chi^2(8) = 1129.25$
prob > $Chi^2 = 0.000$

Source Structured review of annual financial report (generated using STATA)

Annexure 2: Diagnostic Tests

Test of normality for DEBT model: Shapiro–Wilk Test

H_0: The distribution is normal					
Variable	Obs.	W	V	z	Prob > z
lev	80	0.980	1.339	0.640	0.261

Source Structured review of annual financial report (generated using STATA)

Test of normality for DE model: Shapiro–Wilk test

H_0: The distribution is normal					
Variable	Obs.	W	V	z	Prob > z
lev	80	0.990	0.682	−0.838	0.799

Source Structured review of annual financial report (generated using STATA)

Tests of multi-collinearity: correlation matrix between explanatory variables

	Gro	Tang	pr	Risk	Size	Lq
gro	1.000					
tang	−0.246	1.000				
pr	0.328	−0.100	1.000			
risk	−0.101	0.043	−0.367	1.000		
size	0.027	−0.213	0.449	−0.731	1.000	
lq	0.306	−0.243	0.1429	0.238	−0.289	1.000

Source Structured review of annual financial report (generated using STATA)

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