

The relationship between cost capital and performance

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Abstract: Performance evaluation is one of the most significant topics of financial economics based on the necessity of the capital market. The present study selected 81 listed firms on the Tehran Stock Exchange during a six year period covering 2005 to 2010. The required information is gathered from the financial statements available in verified databases. Using the multivariate regression models, the hypotheses have been tested. The findings revealed that there is a negative significant association between the capital structure and firm performance in the low performance firms.

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Introduction

The optimal capital structure, the satisfactory utilization of the financial resources and solvency are significant issues of managerial decision making. Performance evaluation is one of the most significant topics of financial economics based on the necessity of the capital market. Therefore, the function of the financial measures seems essential in evaluating the firms' performance. In the recent decades, the significance and effectiveness of the financial decisions on the growth opportunities became a measure to evaluate the performance and increase the firm's value. On one hand, finance through borrowing is a significant element in decision making at macro and micro levels. Due to the limitations of the capital markets, debts are used in the capital market of Iran at macro and micro levels. Consequently, the present study describes the different aspects of the capital structure and examines the relationship between growth opportunities (as a measure of performance) and the debt rate (as a measure of the capital structure).

cost capital structure

The corrections of the capital structure involve the type and percentage of the securities issued by the entities. The optimal capital structure is a set of ratios aimed to maximize the total value of the entity. Then how is the maximum value of the entity limited?

The expected rate of return of the buyers (stocks and bonds) depends on the structure. It must be mentioned that the management of the finance costs is measured when the entity has a capital structure at its optimal level (when the value of the entity is maximized), because the financial costs should be accompanied by the major failures (Shabahang, 2000).

The modern theories of the cost capital structure

The modern theory of the capital structure has been first introduced in 1958 by Modigliani and Miller and had been followed by many researchers in the field

of capital structure. There have been a number of patterns provided during the prior decades to explain the volatilities of the debt ratio in different firms. Since the late 1970s, static trade-off theory and pecking order theory (Harris and Raviv, 1997) have been developed.

The advantages of issuing debts might include the tax benefits of the interest expense and mitigating the conflicts among the shareholders and managers; issuance costs might also involve the potential costs of the bankruptcy or conflict of interests among the shareholders and creditors (Fama et al, 2006). Based on this theory, the firms try to balance the advantages related to the tax savings and different costs of debt issues.

Literature

Based on the static trade-off theory, the firms try to select a capital structure reaching the point at which the tax rate, assets composite, business risk, profitability and bankruptcy regulations are reflected. In the pecking order model, the defects of the capital market have been emphasized and the transaction costs and information asymmetry and the abilities admit new investments are associated with the internal funds and resources (Boss et al., 2001). This model predicts that there is an information asymmetry among the external investors and the directors about the quality of the new projects. Consequently, the stock market undervalues the new projects in which increasing equity through issuing new stocks has been known as the best resource of finance (Hong and Jason, 2006). Based on this model, the firms select the resource of finance according to the adverse selection problem. Retained earnings have no adverse selection problem and is considered as the best resource of finance. In addition, the firms should issue the debts with the least information cost. Simply stated, the short-term debts should be used before the long-term debts. Capital leases and secured long-term debts should be employed

before the unsecured long-term debts (Frank and Gubal, 2003).

According to trade-off theory, those firms without investment opportunities should issue debt securities to limit the agency costs of management. This theory then predicts that there is a negative association between the debts level and growth opportunities (Chen, 2004). In addition, the growth opportunity is a kind of assets which increases firm value but has no collateral value and that is why a negative association between growth opportunities and the debt ratio is predicted (Titman et al, 1988; Chen, 2004 and Hong and Jason, 2006).

In contrast, the pecking order theory predicts that those firms with investment opportunities use debts as the primary resource of external finance. As a result, it can be concluded that there is a positive association between growth opportunities and debt ratio (Hong et al, 2005). The model, therefore, predicts a positive relationship between growth opportunities and the ratio of debts to the book values.

Using four ratios for measuring the financial leverage, Song (2009) empirically investigated the relationship between financial leverage and investment opportunities of the industrial firms in China. These four ratios included: the ratio of debts to the book value of the equities, the ratio of debts to the market value of the equities, the ratio of long-term debts to the book value of the equities and the ratio of long-term debts to the market value of the stocks. To measure the growth opportunities, the ratio of the market value of the book value of the common stocks has been used. In addition, the firms have been classified in terms of the industry type. He declared that the Chinese firms confronting with higher growth opportunities tend to use less loans.

Serjio and Paolomkas (2010) investigated the relationship between growth opportunities and debts of the Portuguese firms. Their findings revealed that there is no linear relationship between growth opportunities and debts. The low and high growth opportunities indicate the positive relationship between growth opportunity and debts. The findings also confirm that the relationship between growth opportunities and debts are impacted by complicated dimensions of capital structure decisions.

Hypothesis Development

The following hypothesis are developed:

1. There is a significant relationship between growth opportunities and debts in the firms with low growth opportunities.

Analyzing the Hypothesis

The following models are separately estimated to test the hypothesis:

$$\begin{aligned} \text{Model(1): BLEV}_{it} & \\ &= \alpha_0 + \alpha_1 \text{Growth}_{it} + \alpha_2 \text{Size}_{it} \\ &+ \alpha_3 \text{Prof}_{it} + \alpha_4 \text{Tang}_{it} \end{aligned}$$

$$\begin{aligned} \text{Model(2): MLEV}_{it} & \\ &= \alpha_0 + \alpha_1 \text{Growth}_{it} + \alpha_2 \text{Size}_{it} \\ &+ \alpha_3 \text{Prof}_{it} + \alpha_4 \text{Tang}_{it} \end{aligned}$$

The probability of the independent variable (Growth), α_1 , in any models of (1) or (2) is lower than 5% and the hypothesis related to the growth opportunity is confirmed at 95 percent of significance.

Variables Measurement

To test the hypothesis, six variables are used as the independent, dependent and control variables. The variables are calculated based on the following table:

Testing Hypothesis

Hypothesis: There is a significant relationship between growth opportunity and debts of the low growth opportunity companies.

To test this hypothesis, the ratio of liabilities to the book values of the assets (BLEV) and the ratio of liabilities to the market value of the assets (MLEV) are used as the growth proxies. The following hypotheses are then developed:

1. There is a significant relationship between growth opportunity and BLEV in the low growth opportunity companies.

2. There is a significant relationship between growth opportunity and MLEV in the low growth opportunity companies.

The mean of the growth opportunities during 2005 and 2010 has been calculated for the sample firms. The firms with the average growth opportunity at the 50 percent of the bottom are classified as the low growth firms. Among 81 sample firms, 33 firms are classified as the low growth firms for which the developed models are as follows:

Before testing the hypothesis, the sort of data is initially determined by using F Limer and Hausman tests.

To investigate the reliability of the residuals, Durbin-Watson statistics and Jarque Bera test (for the normal distribution of the residuals) and White test (inequality of the variability of the residuals) are used. Table 2 shows the findings of VIF test (non-multicollinearity of the independent variables).

As shown in the table below, the residuals of both regression models are reliable enough and the estimated coefficients of the models are reliable. The estimated coefficients of model estimation in the growth opportunities are provided in table 3 along with the VIF results.

Based on the above findings, R^2 of MLEV is about 86% and it shows that 86 percent of the variation in MLEV is explained by the independent and control variables. This coefficient in BLEV is equal to 79% and in the low growth firms, 79 percent of the variation in BLEV is explained by the independent and control variables of model 2. Adjusted R^2 of both models has different R^2 s and this is because of the variety without

any significant relationship with the dependent variable.

Table 1. Measuring variables

type	Title	abbreviation	Calculation
Dependent	Debt ratio	BLEV	$BLEV_{it} = \frac{TD_{it}}{TA_{it}}$ TD _{it} : Book value of the debts of firm I at the end of t TA _{it} : Book value of the assets of firm I at the end of t
		MLEV	$MLEV_{it} = \frac{TD_{it}}{TD_{it} + MVE_{it}}$ MVE _{it} : Market value of the owner's equity of firm i at the end of year t calculated by multiplying the number of issued stocks at the last price of the stocks at the end of year t
Independent	Growth opportunity	Growth	$Growth_{it} = \frac{(TA_{it} + MVE_{it}) - BVE_{it}}{TA_{it}}$ BVE _{it} : Book value of the owner's equity at the end of year t MVE _{it} : Market value of the owner's equity of firm i at the end of year t calculated by multiplying the number of issued stocks at the last price of the stocks at the end of year t TA _{it} : Book value of total assets of firm i at the end of t
Control	Size	Size	$Size_{it} = \log_{10}(TA_{it})$ TA _{it} : Book value of total assets of firm i at the end of t
	Profitability	Prof	$Prof_{it} = \frac{OI_{it}}{BVE_{it}}$ OI _{it} : Operating income of firm i at the end of year t BVE _{it} : Book value of the owner's equity of firm i at the end of year t
	The ratio of tangible assets	TANG	$TANG_{it} = \frac{TFA_{it}}{TA_{it}}$ TFA _{it} : Sum of tangible fixed assets of firm i at the end of year t TA _{it} : Book value of the assets of firm I at the end of t

Table 2. Results of Limer and Hausman test

Leverage	Test	Statistics	Degree of freedom	Prob.	Result
MLEV	F Limer	11.629	(32.161)	0.00	Using panel data
	Hausman	10.410	4	0.034	Using OLS
BLEV	F Limer	12.718	(32.161)	0	Using panel data
	Hausman	3.223	4	0.521	Using EGLS

Table 3. The reliability of the regression models

Leverage	MLEV		BLEV	
	Test	Prob.	Result	Prob.
D-W	1.93	Non-autocorrelation of the residuals	1.69	Non-autocorrelation of the residuals
J-B	0.74	Normal distribution of the residuals	0.92	Normal distribution of the residuals
White	0	Equality of variances	0.00	Equality of variances

Table 4. Results of VIF

Model1: $MLEV_{it} = \beta_0 + \beta_1 GO_{it} + \beta_2 PROF_{it} + \beta_3 TANG_{it} + \beta_4 SIZE_{it} + \epsilon_{it}$ Model2: $BLEV_{it} = \beta_0 + \beta_1 GO_{it} + \beta_2 PROF_{it} + \beta_3 TANG_{it} + \beta_4 SIZE_{it} + \epsilon_{it}$								
VIF	Model2:BLEV				Model1:MLEV			Models
	Sig.	t	coefficients		Sig.	t	coefficients	Variables
--	0.032	2.164	0.367		0.571	0.568-	0.145-	C
1.14	0.028	2.212-	0.075-		0	6.544-	0.220-	GO
1.17	0.002	3.083-	0.286-		0	5.857-	0.542-	PROF
1.03	0.346	0.946-	0.043-		0.036	2.112	0.098	TANG
1.05	0.061	1.886	.233		0.003	3.019	0.567	SIZE
--	4.153	F	0.792	R ²	28.223	F	0.863	R ²
--	0.003	Prob. F	0.602	R ² adj.	0	Prob. F	0.833	R ² adj.
--	--	--	1.698	DW	--	--	1.939	DW

The probability of F statistics is equal to 0.00 which is lower than 0.01 and it confirms the significance and linearity of the relationships of both regression models. According to the significance tests of the regression coefficients, it is found that the probability of profitability is lower than 5% in the low growth opportunity companies. Therefore, this variable impacts firm's growth at 95 percent of significance. This variable is also found to be inversely associated and it can be concluded that the increase in the debt level of the low growth opportunity firm decreases the profitability.

Generally, in the firms with low growth opportunities, there is a significant negative association between growth opportunity and MLEV and BLEV. As a result, the above hypotheses are confirmed.

Conclusion

The findings indicate that there is a negative association between growth opportunity (performance) and debts (capital structure) in the Tehran listed firms with a low growth opportunity (or low performance). This relationship confirms the trade-off theory because it requires that using debts increases bankruptcy probability. It can be then concluded that the level of debts should be decreased to control the probability of the bankruptcy and prevent the potential decrease in growth opportunities. As a consequence, the relationship between growth opportunity and debts might be negative. The negative relationship between growth opportunity and debts of the firms with low growth opportunities indicate that there is no agency problem in these firms.

Finally, based on the dependency of the relationship between growth opportunity and debts, it is found that this relationship is one of the complicated items of capital structure decisions among the firms listed on the Tehran Stock Exchange. Liquidity constraints and finance costs of the stock market are among the factors which prevent firms entering the stock exchanges and the firms are not able to utilize the growth opportunities.

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