

Determinants of Capital Structure in Iran

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Abstract: Most shareholders, investors and financial controllers are concerned about company's capital structure because the combination of company's capital structure would affect profitability. Determinants of capital structure have been studied by many researchers worldwide but not the determinants of capital structure in Iran. Hence this study is conducted to determine the factors that influence the capital structure of the 129 listed companies in the Tehran Stock Exchange from the period of 2001 to 2008. This study is also to find the relationship between tangibility, profitability, liquidity and firm size with capital structure. The findings indicate that liquidity is the most significant factor that influenced the capital structure, followed by tangibility, size and profitability. Tangibility, liquidity and size are significant and positively related to capital structure but profitability is not significant and negatively related to capital structure of the listed companies in Iran.

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1. Introduction

The objective of the capital structure determinant policies is to specify composition of financial resources in order to maximize the wealth of stockholders. Optimal capital structure is needed to maximize firm value. Each firm sets a target for the debt to equity ratio in order to attempt to obtain it (Noulas & Genimakis, 2011). Hence it is important that the managers made good decision in determining the component of the company's capital structure. Capital structure is a mix proportion of a firm's long-term debt, short-term debt, common stock, preferred stock, and other sources of funds that a firm needs to finance its operations. The capital structure is a way a firm finances its assets and overall operations in addition to some combination of owners' equity, debt, or a combination of securities (Riaz. & Afzal, 2011). These decisions must be made correctly in order to increase firm values (Aghaei, Nadem, Noroozi, & Madin, 2011). Modigliani and Miller (MM) (1958, 1963) created the foundation of the capital structure theory. MM indicated in a perfect and frictionless capital markets that firms could issue riskless debt but firm capital structure was not relevant (Fazlzadeh, Hendi, & Mahboubi, 2011). There are four major theories that influence capital structure are: trade-off theory (Myers, 1984), pecking order theory (Myers and Majluf, 1984), agency cost theory and market timing theory. In order to determine the optimal capital structure, these modern theories take into consideration such issues as taxes, financial distress costs, agency costs, information asymmetry, effects of market imperfections and institutional constraints of firms (Jensen & Meckling,

1976; Modigliani & Miller, 1963; Myers, 1984). Trade-off theory (TOT) states that a target debt–equity ratio is approached at the point where the tax advantage of debt is offset by the costs of financial distress and the costs of prevailing market imperfections are minimized (Kraus & Litzenberger, 1973) . Pecking order theory (POT) (Myers, 1984, Myers and Majluf, 1984) explains that firms follow financing hierarchy to minimize the problem of information asymmetry between the firm's managers (insiders) and the shareholders (outsiders). Agency cost theory (ACT) says that the optimal capital structure is settled by agency costs, which contain the costs for both debt and equity issue. The costs which are related to equity issue consist of monitoring expenses of the shareholders and bonding expenses of the managers (Afrasiabi & Ahmadiania, 2011; Jensen & Meckling, 1976). The ACT showed that agency costs between equity and debt play a major role in determining optimal capital structure. The prime cause of agency costs is the principle agent conflict and asymmetric information (Fawad & Zaheer, 2011; Jensen & Meckling, 1976). Market timing theory (MTT) argues that firms set timing of their equity issues in the sense that they issue new stock when the stock price is perceived to be overvalued, and buy back own stocks when there is under valuation. This will cause fluctuations in stock prices and affect capital structure. The remainder of this paper is organized as follows. Section 2 provides literature review which includes capital structure theories and capital structure determinants. Section 3 describes the methodology and variable measuring. Section 4 discusses the findings, and section 5

describes the conclusion of the study, and section 6 describes the suggestions for future research.

2. Literature Review

2.1 Capital structure theories

The MM theorem (1958) first constituted the basis for contemporary thinking on capital structure by stating that in a perfect capital market (no transaction; bankruptcy costs and perfect information) firms and individuals can borrow at equal interest rate; no taxes; and investment decisions do not influenced by financing decisions. Nonetheless, there is a big difference between debt financing and equity financing in the real world with corporate taxes and dividends paid to the shareholders; commonly recognized as interest tax shield. Based on TOT, the target debt to equity ratio is determined by firms. Firms try to balance between the costs and benefits of equity and debt. Firms consider the optimal capital structure that maximizes value and help to decrease external claims. The debt is set with tax shield. Informational costs related to debt are less than equity, and resulted in lowering the cost of capital and maximize the value of the firm (Titman, 1984). According POT, there exist asymmetric information between outsiders and insiders. Outsiders have less information than insiders. This theory states that firms follow financing hierarchy to minimize the problem of information asymmetry between the firm's inside managers (insiders) and the outside shareholders. (Myers, 1984; Myers. & Majluf, 1984). Market timing theory (MTT) has increasingly challenged both TOT and POT. The market timing states that firms prefer external equity when the cost of equity is low, and debt otherwise. According to the market timing theory, corporate executives sometimes perceive their risky securities as devalue in the market. Firms issue equity when they perceive the relative cost of equity is low, and issue debt when they perceive the relative cost of equity is high (Huang & Ritter, 2004).

2.2 Determinants of Capital Structure

Researchers have conducted several studies on the determinants of capital structure. Among the important variables used in the previous research are: tangibility, liquidity, firm size and profitability.

2.2.1 Tangibility

Tangibility refers to fixed assets to total assets. Trade off theory TOT and POT suggest a positive relationship between tangibility and leverage/borrowing. The firm's high fixed assets ratio can afford to go for higher debt because of the high collateral value of their assets. Fix assets can be utilized as collateral and therefore can lower the risk of a creditor and enlarge the value of the assets in case of bankruptcy. The greater its ability to issue

secured debt, the more tangible is the firm's assets, so there will be a positive relationship between debts and fixed assets.

2.2.2 Liquidity (LIQ)

Liquidity is measured by current assets to current debt. The greater this ratio, the less the amount of financing from the debts. Liquidity is considered as negative debt since it reduces the need to take on debt. According to Ozkan (2001) such negative relationship eliminates potential conflicts between debt holders and shareholders. The rationale is that the greater the liquidity level, the more the shareholders could manipulate the liquid assets of the firms at the expense of debt holders. However, liquidity can produce a positive influence in case high liquidity where high liquidity eases the availability of debt (Ramlall, 2009).

2.2.3 Firm Size

Size can be measured by the natural logarithm of total sales. The general understanding about the size is that large firms can afford heavy debts because of the high asset base. However previous studies found a positive relationship between firm size and capital structure. (Abor, 2008; Rajan, 1995; Riaz. & Afzal, 2011). POT expresses that there is a negative relationship between firm size and leverage. The larger the size, the more information will be revealed by firms to the outsiders as compared to the small sized firms. Firms with less asymmetry information may issue equity more than external financing (Rajan and Zingales, 1995). According TOT larger firms are well diversified and they will have stable cash flows and their chances of bankruptcy are less as compared to small firms. Thus large firms will prefer high leverage.

2.2.4 Profitability

Profitability is measured by earnings after tax to total assets. TOT assumes a positive relationship between profitability and leverage. Firms with more stable cash flows are more profitable and they prefer to use debt as they have more debt servicing capacity and more earn profits from tax shield. Likewise, profitable firms having free cash flows should gain from debt to meet their requirements and should not waste free cash flow to maintain firm liquidity (Ahmad & Abbas, 2011; Brendea, 2011). POT considers that firms should use their internal first funds from retained earnings and then must go for leverage. Companies with high profits should not obtain financing through debt. Firms with higher profits should utilize more internal financing and reduce external financing. Such firms have enough funds in the firm and they don't need external financing. Therefore there is a negative relationship between leverage and profitability.

Jensen (1986) Al-Sakran, (2001); Chen, (2004) and Chakraborty, (2010) have empirically proved to show a negative relationship between leverage and profitability.

3. Methodology

The study utilizes the financial data of the listed companies in Tehran Stock Exchange from 2001 to 2008 (8 years).129 firms were identified from different industries of Tehran Stock Exchange.

Table 1: Selected industries of the Tehran Stock Exchange

N	Industry	Number of firms	Percent
1	Machinery and equipment	22	0.17
2	Food products & Beverage	20	0.16
3	Textiles	9	0.07
4	Chemical and pharmaceutical	19	0.15
5	Petroleum chemical products	18	0.14
6	Non-metallic mineral products	11	0.09
7	Automotive Parts Manufacturing	17	0.13
8	Metal products and Basic metals	13	0.10
Total		129	

Source : ("datastream ,Tehran Stock Exchange," 2012)

To examine the relationship between tangibility, profitability, liquidity, firm size and capital structure, panel data are used. Time series and cross-sectional data are integrated. The firms chosen met the following requirements .They are:

1. Actively traded companies from 2001 to 2008 in Tehran Stock Exchange.
2. No changes in their main activities and their financial year.
3. Fiscal year ended March.

Two regression models are used. To investigate the relationship between the four independent variables with capital structure. Current debts constitute 85% of the total debts, the ratio of current debts to total asset is considered as a dependent variable and its effects on the determinant of capital structure are studied by the following model:

$$CS_1 = a_0 + a_1TANG_{it} + a_2EAT_{it} + a_3SIZE_{it} + a_4LIQ_{it} \tag{I}$$

$$CS_2 = a_0 + a_1TANG_{it} + a_2EAT_{it} + a_3SIZE_{it} + a_4LIQ_{it} \tag{II}$$

CS_1 = Book value of debt to total assets

CS_2 = Current debt book value to total assets.

Debt ratio the dependent variable and the independent variables show in the table 2.

Table 2. Independent variable

Variables	Proxy
Tangibility	Total fixed assets to total assets
Profitability	The earnings after tax to total assets
Liquidity	Current assets to current liabilities
Firm size	Natural log of sales

3. Results

1.3. Descriptive statistics:

The Table 3 and 4 present the summary of the descriptive statistics of the capital structure.

Table3: Descriptive Statistic (CS_1)

Volatility Title	Dependent variable	Independent variable			
	Capital structure	profitability	Liquidity	Tangibility	size
Mean	0.802	0.205	1.151	0.346	5.425
Median	0.710	0.189	1.062	0.325	5.352
Variance	0.600	0.033	0.264	0.030	0.491
Standard deviation	0.77	0.18	0.51	0.17	0.70
Max.	11.340	2.392	3.782	0.842	8.325
Min.	0.216	-0.457	0.070	0.050	2.885
N	129	129	129	129	129

Table4: Descriptive statistic (CS_2)

Volatility title	Dependent variable	Independent variable			
	Capital structure	Profitability	Liquidity	Tangibility	Size
Mean	0.675	0.205	1.151	0.346	5.425
Median	0.616	0.189	1.062	0.325	5.352
Variance	0.339	0.033	0.264	0.030	0.491
Standard deviation	0.58	0.18	0.51	0.17	0.70
Max.	9.649	2.392	3.782	0.842	8.325
Min.	0.140	-0.457	0.070	0.050	2.885
N	129	129	129	129	129

Table.3 shows that total debt to total assets is 0.802, the median is 0.710 and the variance is 0.600.The maximum and minimum of 11.340 and 0.216 respectively. As Table.3 and 4 indicate that the mean earning after tax is 0.205. The mean of current assets to current debts is 1.151 that is at the top of the scale. The mean of total fix assets to total assets show 0.346, it means the relationship between tangibility and capital structure is low, and the mean of size is 5.425, it means the relationship between size and capital structure is high. The Max and Min of earning after tax are 2.392 and -0.457 the Max and Min of current assets to current debts are 3.782 and 0.070, the Max and Min of total fix assets to total assets are 0.842 and 0.050, and the Maximum and Minimum of size are 8.325 and 2.885. Table 4 Shows, the mean of current debt to total assets is 0.675, the median is 0.616, and the variance at 0.339 with the maximum and minimum are 9.649 and 0.140.As mentioned, 67.5 percent of current debt is total debt; the max and min are 11.340 and 0.216.

With regard to high inflation rate, banks and financial institutions pay short term loan, thus companies that take a short term loan cannot pay on maturity, and therefore they have to extend the loan with high interest rate, this results in an increase in debt. Because the inflation rate increases every year, companies reevaluate their assets to increase the equity or to decrease debt ratio, thus tangibility is negatively related to capital structure. Companies don't keep all the profit for new financing and a high

percent of the profit is distributed among shareholders, therefore when companies need funds, the retained earning is not enough and they have to finance by loan too, thus there is no relationship between profitability and capital structure.

Regression Results

1.2.3. Table 5, shows the regression results of Models 1 and 2

Table 5: Models 1&2

Variable	Coefficient		t-Value		P-Value	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Tangibility	-0.281	-0.353	-7.553	-9.85	0.000	0.000
Profitability	-0.051	-0.036	-1.436	-1.033	0.151	0.302
Liquidity	-0.498	-0.568	-12.702	-15.02	0.000	0.000
Size	-0.170	-0.138	-4.969	-0.186	0.000	0.000

	Model 1	Model 2
R	0.499	0.549
R ²	0.249	0.301
Adj R ²	0.245	0.297
F-statistic	57.421	74.55

The model (1,2) (Table 5), shows a significant and negative relationship between tangibility and debt ratio. It means higher level of tangibility would decrease the level of debt ratio. The negative relationship between tangibility and debt ratio in this study are in agreement with several studies , Janbaz (2010), Yue (2011), Coleman & Cole (2000). Implying that there is not a significant relationship between profitability and debt ratio. Gurcharan (2010) found insignificant relationship between profitability and debt ratio .This study doesn't agree with Deesomsak et al (2004), Gurcharan. (2011), Huang and &Song (2005), Elashker &Wattanasuwannee (2003), Riaz &Afzal, (2011) Jensen (1986) Al-Sakran, (2001); Chen, (2004) and Chakraborty, (2010) . Liquidity is significant and negatively related to debt ratio, this study agree with several studies such as, Deesomsak et al. (2004), Janbaz (2011) and Ozkan (2001).There is a significant and negative relationship between size and debt ratio. Pecking order theory (POT) expresses that there is a negative relation between firm size and leverage. The larger the size the more information will be revealed by firms to the outsiders as compared to the small sized firms. Firms with less asymmetry of information may issue equity more than external financing (Rajan and Zingales, 1995). The negative relationship between size and debt ratio agrees with Riaz &Afzal study (2011) . According to Gurcharan (2011), size has a negative relationship with capital structure in Malaysia and Thailand and positive relationship with capital structure in Indonesia and Phillipine, The result about size in this study doesn't agree with , Mayers and Majluf (1984), Chin Huat (2008), Mayers and Majluf (1984)

, Janbaz (2011) , Wiwattanakantang (1999) and Deesomsak et al. (2004). The models 1 and 2 show the correlations between three variabels of tangibility, liquidity and size and capital structure presented a p-value lower than 0.05 ($0.000 < 0.05$). Thus this analysis finds out a significant relationship between each of tangibility, size and liquidity with the capital structure. The correlations between profitability with the capital structure presented a p-value higher than 0.05 ($0.151, 0.302 > 0.05$). Thus this analysis finds out there is not a significant relationship between profitability and capital structure at the 5% level. The amount of R2 is always between 0 and 1, when it equals 1, means that estimated regression explains the whole changes in the dependent variable, and when it equals 0, means that estimated regression could not explain any of the mentioned changes. R² of model 1 showed at 0.249. The independent variable is 24.9 percent of the variation of the dependent variable. R² of model 2 showed is 0.301 .It means that the independent variable can explain 30.1 percent of the variation of the dependent variable.

Table 6: show the summary ANOVA of model 1&2

Regression	Total square errors	Degree of freedom	Mean square errors	F	Significance of level α
Model 1	104.045	4	26.011	57.421	0.000
Model 2	71.143	4	17.786	74.55	0.000

Significant at 5% level

Variable	Coefficient	Ranking	
		Model 1	Model 2
Tangibility	Sig	2	2
Profitability	Not Sig	4	4
Liquidity	Sig	1	1
Size	Sig	3	3

Table.6 shows, the important level of α is less than 5%, that is, the model is 95%.Total square error stood at 104.045 and 71.143.Which imply that there is a relationship with mean square errors. The degree of freedom is 4 that equal 6.39 according to Fishar (F) table. With regard to the fact that F-number (57.421and 74.55) is bigger than the number in the Table (6.39) and also " α " is less than 5%, it can be included that independent variable affects depended variable and create a meaningful relation.

4. Discussions

In Model 1 & 2 liquidity is the most significant variable, following that tangibility is the most significant variable and after them the size is the most significant variable. Profitability coming last and not significant variable .This study aims to find the determinants of capital structure and examine the relationship between tangibility, profitability, liquidity and firm size and capital structure .The in the data are collected from the129 listed companies in the Tehran Stock Exchange from 2001 to 2008.

Analysis of the data is based on the two models; tangibility has the significant effect on capital structure. Trade of theory (TOT) and pecking order theory (POT) suggest a positive relation between tangibility and capital structure. The results show as the tangibility increases it will lead to a positive relationship between tangibility and capital structure. Liquidity is negatively related to debt since it reduces the need to take on debt; therefore, liquidity is negatively related to capital structure. The relationship between profitability and capital structure is examined. As a result is not a significant capital structure. Finally the results show that in both models, the firm's size is negatively related to capital structure.

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