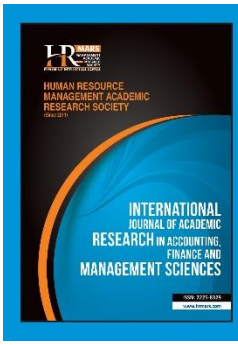

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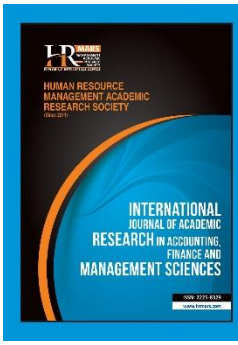
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Comparative Study of Capital Structure Determinants in Selected Stock Exchanges of Developing Countries and Tehran Stock Exchange

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Abstract
This paper studies determinants of capital structure in listed firms of selected stock exchanges of developing countries and Tehran stock exchange, and comprises effects of these determinants on selected stock exchanges with Iran. In this study, determinants of capital structure are studied in firm and country levels. In firm-level profitability, distance from bankruptcy, size and tangible assets, and in country level stock market development and GDP growth are studied. Data are collected from Compustat Global Vantage database, World Bank databases and Tadbirpardaz software. Panel Regression is used for analysis and Excel and EViews 6 and F and t test statistics are used. Results of study in level of developing countries show that except development of stock market, GDP growth and distance from bankruptcy, all variables have a significant relationship with capital structure; distance from bankruptcy and tangible assets on Tehran Stock Exchange have a significant relationship with capital structure. Impact of distance from of bankruptcy, size and tangible assets in Tehran Stock Exchange and selected developing countries stock exchanges capital structure are different. This paper enables to comparison, benchmarking, identifying strengths and weaknesses and its results can be used to determine strategies and objectives of firms financing.
Keywords: Capital Structure, Determinants of Capital Structure, Debt Ratio

Introduction

Providing financial resources is an important part of any business. Financial resources can be required from equity or debt. Combination of debt and equity shows capital structure. Policy of capital structure is maintaining balance between risk and return (Abdo & Miri, 2003). Debt in financial structure of a firm can increase earning because of its tax saving and consequently increases stock return, on the other hand, due to interest costs and risk of non-payment of debt financial risk can increase and thus can reduce stock return (Chipeta & *et.al*, 2013). Hence, one of the important responsibilities of financial managers is increasing shareholder wealth, so their main concern is firm's capital structure. As a result, managers are looking for information that identifies relationship between capital structure and shareholder wealth (Rahimi, 2009). Capital structure has known as most important parameter that affecting firms evaluating and their orientation in capital markets. However, in today

dynamics environment, credit rating of firms is largely dependent on their capital structure. Firms strategic planning has driven to choose affecting resources on shareholder wealth maximizing (Sinai & Rezayian, 2006). In a comparative study between Iran and developing countries, impact of various factors on capital structure in Iran and other countries can be compared. This comparison helps to identify gaps of determinants of capital structure impact. In future researches should study reasons of these gaps and, if necessary, try to resolving them.

This research aims to analyze determinants of capital structure at firms and country levels in selected stock exchanges of developing countries and Tehran Stock Exchange. According to study of Kayo and Kimura (2011), this study analyzes profitability, distance from bankruptcy, size and tangible asset in firm level and stock market development and GDP growth is also analyzed in country level. This study has 2 population and results of each populations is compared with each.

Research Questions

Based on international and national studies have been done and comparison between results of both national and international levels, research questions are as follow:

1. What are determinants of capital structure on selected developing countries stock exchanges?
2. What are determinants of capital structure on Tehran Stock Exchange?
3. Which determinants impact is different in selected developing countries stock exchanges and Tehran Stock Exchange?

Hypothesis is answers that will be given to each of these questions for each determinant of capital structure. This study has six determinants of capital structure, so 18 hypotheses are tested.

Theoretical Background

Capital Structure

Bolcky (1999) introduced capital structure as general claim on assets of firm. He said capital structure includes securities issued, private investments, bank debt, commercial debt, lease agreements, tax liabilities, debt retirement, deferred compensation to directors and employees, work performance bond deposits, and other possible debt obligations. In general, capital structure refers to mix of resources used to financing. Usually, capital structure is measured by ratio of debt to total assets, ratio of equity to total assets, ratio of debt to equity and ratio of debt to equity (Stayesh *et.al,* 2010).

Different Theories of Capital Structure

Static Trade-off Theory

This theory states that tax benefits resulting from liability, increases firm value. On the other hand, costs of financial distress and possibility of bankruptcy due to lack of timely fulfillment of obligations, will reduce firm value. Therefore, firm's capital structure can be viewed as a balance between tax benefits of debt and costs of financial distress and bankruptcy that may be considered as debt. Hence, these two factor balance each other (balance between benefits and costs of debt) will lead to optimal use of debt in capital structure (Izadinia & Rasayan, 2010).

Agency Costs Theory

According to this theory, that first time was presented by Jensen and McKing 1976, firm's capital structure arising from agency costs of interest conflicts between different stakeholders participation. These two researchers identified two types of interest conflict: a) Conflict of interest between managers and shareholders, and b) conflict of interest between shareholders and debt holders of firm. According to Jensen and McKing, by creating a balance between benefits of debt, such as tax benefits and agency costs of debt we can achieve to an optimal capital structure (Izadinia & Rasayan, 2010).

Free Cash Flow Theory

One of major theories of capital structure is free cash flow theory; this theory states that high leverage, when firm's operating cash flow is more than its profitable investment opportunities, cause increasing firm's value despite threat of financial distress (Myers, 2001).

Pecking Order Theory

Pecking Order Theory asserts that borrowing always preferred to new equity, because all other costs and benefits of debt, in comparison with effects of asymmetric information of equity, is second-order. Asymmetric information effects on choosing between internal and external financing resources new issue of bonds and stocks; so pecking order theory suggests that managers prefer to use internal funds primarily and then use risky debt, and finally resorted to issue new shares for financing new investments (Pravish & Agyenim, 2010).

Signaling Theory

According to signaling theory (ST) external borrowing generally is used to give a positive signal to market that firm has stable cash flow and is able to repay loan and its interest, and thus increases trust of shareholders to firms. Similarly, issuing new shares indicates that firm has no stable cash flow and is not in a position to repay loan and its interest (Ross, 1977).

Experimental Background of Study

Many studies have been carried out in field of Capital structure and its determinants and found different results. In flowing we mention some of them.

Oztekin and Flannery (2013) studied institutional determinants of capital structure adjustment speeds. They compare firms' capital structure adjustments across countries and investigates whether institutional differences help explain the variance in estimated adjustment speeds. They find that legal and financial traditions significantly correlate with firm adjustment speeds. More narrowly, institutional features also relate to adjustment speeds, consistent with the hypothesis that better institutions lower the transaction costs associated with adjusting a firm's leverage. Such associations between institutional arrangements and leverage adjustment speeds are consistent with the dynamic trade-off theory of capital structure choice. Lim (2012) investigated determinants of capital structure empirical evidence from financial services listed firms in China. The results show that profitability, firm size, non-debt tax shields, earnings volatility and non-circulating shares are significant influence factors in financial sector. Moreover, firm size is positively related to the corporate leverage ratio. It is also found that Chinese institutional characteristic affects the capital choice decision. While it confirmed that capital structure determinant of financial firms are similar to other industry, the largely state ownerships do affect capital structure choices.

Setayesh *et.al* (2012) has studied determinants of capital structure from agency cost theory view. Results indicate that corporate strategic mechanisms including ownership concentration, percentage of non-duty members of board and board independence, have not significant effect on book and market financial leverage of studied firm. However, there is a positive and significant relationship with agency cost and book and market leverage. Results also indicate that ratio of return on assets, payable earnings per share and Q Tobin ratio affect book leverage. Finally, by reflecting on results, we found that in both book leverage and market leverage models, effect of agency costs are more than of other variables.

Metan *et.al* (2011) in their study examined impact of firm characteristics on capital structure of listed firms in Tehran Stock Exchange. This study investigates impact of some firm's characteristics such as firm size, asset structure, profitability, expectations growth, interest expense coverage ratio, quick ratio and return on assets in determination of firm's capital structure. Results show that capital structure and asset structure, profitability, expectations growth, quick ratio and return on assets have a significant and negative relation and capital structure and size and interest expense coverage ratio have a significant and positive relation.

Research Methodology

Needed data to calculate variables and testing hypothesis for Iranian firms are collected from Tadbirpardaz software and Codal web site and for non-Iranian firms financial data collected from Compustat Global Vantage database and World Bank database. Therefore, pool and panel regression used for analyzing data and, Excel and EViews with F-test and t-test is used for analysis.

Relationship between capital structure and its determinants has been studied by using pool and panel regression analysis as follows:

$$LEV_{ijkl} = \beta_{0ij0l} + \beta_{1ij1l}\mathbf{PROF}_{ijkl} + \beta_{2ij2l}\mathbf{DBKRT}_{ijkl} + \beta_{3ij3l}\mathbf{SIZE}_{ijkl} + \beta_{4ij4l}\mathbf{TANG}_{ijkl} + \beta_{5ij5l}\mathbf{MKT}_{ijkl} + \beta_{6ij6l}\mathbf{GDP}_{ijkl} + \varepsilon_{ijkl} \quad (1)$$

i represents year, j represents firm, k represents industry, l represents country, β coefficients represents effect of variable, and e represents errors. Variables in equation are defined as follows. LEV is ratio of total debt to total assets (capital structure), TANG ratio of fixed assets (fixed assets over total assets), SIZE size(natural log of sales), GROW growth opportunities(ratio of total market value of firm to total assets), PROF profitability(ratio of operating income to total assets) and DBKRT shows distance of any firms to bankruptcy. Distance from bankruptcy is calculated as follows:

$$Z = 3.3\left(\frac{EBIT}{totalassets}\right) + \frac{sales}{totalassets} + 1.4\left(\frac{Retainedearnings}{totalassets}\right) + 1.2\left(\frac{WorkingCapital}{totalassets}\right) \quad (2)$$

First, data of financial ratios to analysis determinants of capital structure extracted from Tadbirpardaz software and Compustat Global Vantage database and variables were calculated by Excel software and for testing hypothesis, then variables were entered to Eviews6 software. Since variables in this study are calculated among different firms and in period of 1381 to 1391 and 2002 to 2012, so data for this study is estimated pool or panel regression. For choosing between these two methods, F Limr test is used.

F Fisher statistics is used for testing linear relationship between dependent and independent variables and significance of overall regression. There are two methods for estimating panel data, fixed effects and random effects. In present study, Housman test is used to determine type of panel regression model. Durbin-Watson test is used to test autocorrelation, that if value of this statistic be in range of 1.5 to 2.5, indicating lack of correlation. If there is autocorrelation in error terms in regression model by entering break time, trying to remove autocorrelation. t-test and significance levels of them are used to determine significance of regression coefficients.

Results

Data in this study has been collected from 24 selected stock exchanges of developed countries with 6516 firms and 82 firms from Iran. Descriptive statistics was used to summarize and classify data and inferential statistics were used to analyze data.

Table 1
Names of studied countries and number of their firms

Number of firms	Country	Abbreviation	number
14	United Arab Emirates	ARE	1
31	Argentina	ARG	2
172	Brazil	BRA	3
100	Chile	CHL	4
930	China	CHN	5
10	Colombia	COL	6
99	Cayman Islands	CYM	7
127	Indonesia	IDN	8
29	India	IND	9
82	Iran	IRN	10
15	Lithuania	LTU	11
11	Latvia	LVA	12
72	Mexico	MEX	13
272	Malaysia	MYS	14
10	Nigeria	NGA	15
14	Pakistan	PAK	16
56	Peru	PER	17
24	Philippines	PHL	18
21	Russian Federation	RUS	19
41	Saudi Arabia	SAU	20
234	Thailand	THA	21
50	Turkey	TUR	22
33	Taiwan	TWN	23
18	South Africa	ZAF	24
6516	-	-	**total**

Source: Findings

In tables 2 and 3 descriptive statistics of study populations are shown, including mean, standard deviation, maximum and minimum values for each of variables.

Table 2

Descriptive statistics of variables in selected developing countries stock exchanges

Observation	standard deviation	mean	maximum	minimum	Abbreviation	Variables
22517	0.131	0.979	1.000	0.000	LEV	Capital Structure
22517	0.984	0.650	0.800	-0.500	PROF	Profitability
22517	1.283	1.227	8.000	-12.000	DBKRT	Distance from bankruptcy
22517	1.241	3.403	8.300	0.000	SIZE	Size
22517	0.221	0.500	1.000	0.000	TANG	Tangible assets
22517	3.686	7.145	14.200	-5.000	GDP	GDP Growth
22517	0.437	0.685	1.780	0.400	STK	stock market Development
22517	0.492	0.410	1.000	0.000	MKT	Financial system
22517	0.334	0.982	0.260	0.150	MUNIF	Munificence
22517	0.566	0.178	0.380	0.000	DYNAM	Dynamics

Source: Findings

Table 3

Descriptive statistics of variables in selected Tehran stock exchange

Observation	standard deviation	mean	maximum	minimum	Abbreviation	Variables
902	0.10	0.50	0.60	0.00	LEV	Capital Structure
902	0.13	0.15	0.60	-0.20	PROF	Profitability
902	0.91	1.51	4.00	-1.00	DBKRT	Distance from bankruptcy
902	0.61	5.53	8.30	4.00	SIZE	Size
902	0.16	0.24	0.70	0.00	TANG	Tangible assets
902	2.48	4.24	7.82	1.40	GDP	GDP Growth
902	0.50	0.20	0.29	0.12	STK	stock market Development
902	0.00	0.00	0.00	0.00	MKT	Financial system
902	0.40	0.15	0.26	0.20	MUNIF	Munificence
902	0.70	0.13	0.38	0.00	DYNAM	Dynamics

Source: Findings

Information of above tables is suitable to create a general knowledge about status of variables in each population, but due to lack of space, we did not interpret data of tables.

Linear relationship between independent and dependent variables in 2 populations is studied to test hypotheses. Therefore regression models that introduced have been

estimated for 2 populations. Since in this study panel data was used, it is necessary before estimating models, some tests done to determine appropriate method of estimation. In table 4 assumptions of study model in each population are studied.

Table 4
Test of Existence and Correctly of Models

Durbin-Watson test	Determination coefficient (R^2)	Levin test	Housman test	F limer test	Meaningful model test	Test type	Hypotheses
1.92	0.89	27682.51	249.22	13.61	73.19	statistic test	Hypothesis 1 developing
-	-	0.00	0.00	0.00	0.00	p-value	
0.99	0.14	-	0.00	7.43	24.77	statistic test	Hypothesis 2 Tehran
-	-	-	0.10	0.00	0.00	p-value	

Source: Findings

As seen in above table, significance level of F Fisher test for all hypotheses is less than 5% of error level, so regression relation between study variables in 2 populations is accepted. F Limr test for each 2 hypothesis is below 5 %, then data is analyzed in panel method, but Housman test shows that hypothesis 1 tested in fixed effect way and hypothesis 2 using random effect. According to Levine test in developing countries, there is problem of variance anisotropy. So to solve problem of variance anisotropy, models estimate by using generalized least squares (GLS), and Durbin-Watson statistic shows that model of study hypotheses have not autocorrelation.

Table 5

Results of research hypotheses estimation

Dependent variable: capital structure								
Test Results of Question 2(Tehran)				Test Results of Question 1(Developing)				Variables
Probability	T-statistics	Standard deviation	Regression coefficient	Probability	T-statistics	Standard deviation	Regression coefficient	
0.40	2.13	0.47	0.95	0.00	39.20	0.19	0.75	Constant factor
0.82	-0.22	0.45	-0.99	0.00	-5.85	0.25	-0.15	Profitability
0.00	-3.30	0.62	-0.20	0.55	0.036	0.31	0.20	Distance from bankruptcy
0.15	-1.45	0.79	-0.11	0.00	7.52	0.48	0.36	Size
0.00	7. 8384	0. 0236	0. 1848	0.00	13.05	0. 00167	0.02	Tangible assets
0.90	0.12	0.11	0.10	0.90	-1.69	0.40	-0.10	GDP Growth
0.42	0.81	0.47	0.38	0.90	-0.12	0.30	-0.30	stock market Development

Source: Findings

To investigate effect of determinants of capital structure, t-statistic and calculated probability in 0.05 error level are used. Based on results in Table 5, if value of calculated t-statistics for each coefficient be larger than critical value of t-statistics 0.05 error level and calculated significance level for each of coefficients be less than 0.05, indicates that obtained coefficients are significance. Sing and amount of obtained coefficient indicates its positive or negative impact and its amount on capital structure.

Question 1 (model of developing countries)

Results indicate that except stock market development, country's GDP growth and distance from bankruptcy, all variables in developing countries have a significant relationship with capital structure and except profitability other variables have positive and linear relationship capital structure.

So third question model (developing countries) provided as follows:

$$LEV_{ijkl} = -0.15PROF_{ijkl} + 0.36SIZE_{ijkl} + 0.022TANG_{ijkl} + \varepsilon_{ijkl} \qquad (3)$$

Question 2 (model of Tehran)

Results indicate that distance from bankruptcy and tangible assets on Tehran Stock Exchange have significant relationship with capital structure, that distance from bankruptcy

has negative relationship and tangible assets has positive and linear relationship with capital structure.

So fourth question model (Tehran) provided as follows:

$$LEV_{ijkl} = -0.202DBKRT_{ijkl} + 0.1848TANG_{ijkl} + \varepsilon_{ijkl} \quad (4)$$

Question 3

To compare impact of determinants of capital structure in selected stock exchanges of developing countries and Tehran Stock Exchange, differences in regression coefficients test with t variable was used. These variables calculated as follows (Azar &Momeni, 2007).

$$t = \frac{\beta_1 - \beta_2}{(SE_1 + SE_2)/2} \quad (5)$$

If absolute value of t be larger than 1.96, impact of determinates of capital structure in selected stock exchanges of developing countries and Tehran Stock Exchange are different and if absolute value oft be less than 1.96 there is no difference. These comparisons are summarized in Table 6:

Table 6

Comparison of determinates of capital structure impact in selected developing countries stock exchanges and Tehran Stock Exchange

t variable	selected developing countries stock exchanges					Tehran Stock Exchange				
	Fitting method: panel data-fixed effect					Fitting method: panel data-random effect				
	Probability	T-statistics	Standard deviation	Regression coefficient	variable	Probability	T-statistics	Standard deviation	Regression coefficient	variable
0.800	0.000	39.200	0.193	0.753	Constant factor	0.40	2.13	0.47	0.95	Constant factor
0.210	0.000	-5.846	0.250	-0.150	Profitability	0.82	-0.22	0.45	-0.99	Profitability
-6.320	0.550	0.603	0.310	0.200	Distance from bankruptcy	0.00	-3.30	0.62	-0.20	Distance from bankruptcy
-3.600	0.000	7.524	0.480	0.360	Size	0.15	-1.45	0.79	-0.11	Size
12.900	0.000	13.050	0.0017	0.022	Tangible assets	0.00	7.8384	0.02358	0. 1848	Tangible assets
0.350	0.900	-1.687	0.400	-0.100	GDP Growth	0.90	0.12	0.11	0.10	GDP Growth
1.600	0.900	-0.115	0.300	-0.300	stock market Development	0.42	0.81	0.47	0.38	stock market Development

Source: Findings

Results in Table 6 show that impact of tangible assets, distance from bankruptcy and size in Tehran Stock Exchange and selected developing countries stock exchanges with capital structures is different.

Following table summarizes results of research hypotheses:

Table 7

Summary of Hypothesis Testing Results

Confirm or Reject hypothesis	Probability	Hypothesis
Confirm	0.00	**Question 1: Determinants of capital structure in listed firms of selected stock exchanges of developing countries can be determined.**
-	-	Sub-hypotheses related to Question 1:
Confirm	0.0000	There is a significant relationship between profitability and capital structure of listed firms of selected stock exchanges of developing countries.
Reject	0.5463	There is a significant relationship between distance from bankruptcy and capital structure of listed firms of selected stock exchanges of developing countries.
Confirm	0.0000	There is a significant relationship between size and capital structure of listed firms of selected stock exchanges of developing countries.
Confirm	0.0000	There is a significant relationship between tangible assets and capital structure of listed firms of selected stock exchanges of developing countries.
Reject	0.0915	There is a significant relationship between stock market development and capital structure of listed firms of selected stock exchanges of developing countries.
Reject	0.9078	There is a significant relationship between GDP growth and capital structure of listed firms of selected stock exchanges of developing countries.
Confirm	**0.00**	**Question 2: Determinants of capital structure in listed firms of Tehran stock exchange can be determined.**
-	-	Sub-hypotheses related to Question 2:
Reject	0.8238	There is a significant relationship between profitability and capital structure of listed firms of Tehran stock exchange.
Confirm	0.0010	There is a significant relationship between distance from banktrucy and capital structure of listed firms of Tehran stock exchange.
Reject	0.1483	There is a significant relationship between size and capital structure of listed firms of Tehran stock exchange.
Confirm	0.0000	There is a significant relationship between tangible assets and capital structure of listed firms of Tehran stock exchange.
Reject	0.9020	There is a significant relationship between stock market development and capital structure of listed firms of Tehran stock exchange.

Confirm or Reject hypothesis	Probability	Hypothesis
Reject	0.4210	There is a significant relationship between GDP growth and capital structure of listed firms of Tehran stock exchange.
Confirm	-	**Question 3: Impact of determinants of capital structure in selected developing countries stock exchanges and Tehran Stock Exchange is different.**
Type of impact	**t variable**	Sub-hypotheses related to Question 3:
Reject	0.21	Impact of profitability in listed firms of Tehran Stock Exchange and selected Stock Exchanges of developing countries is different.
Confirm	-6.32	Impact of distance from bankruptcy in listed firms of Tehran Stock Exchange and selected Stock Exchanges of developing countries is different.
Confirm	-3.60	Impact of size in listed firms of Tehran Stock Exchange and selected Stock Exchanges of developing countries is different.
Confirm	12.90	Impact of tangible assets in listed firms of Tehran Stock Exchange and selected Stock Exchanges of developing countries is different.
Reject	0.35	Impact of stock market development in listed firms of Tehran Stock Exchange and selected Stock Exchanges of developing countries is different.
Reject	1.60	Impact of GDP growth in listed firms of Tehran Stock Exchange and selected Stock Exchanges of developing countries is different.

Source: Findings

Conclusions and Recommendations based on Findings

Based on first research question, in developing countries levels except stock market development, country's GDP growth and distance from bankruptcy, all other variables have a significant relationship with capital structure. In developing countries should review reason that why GDP growth and distance from bankruptcy have no effect on capital structure? In future studies should identify these reasons and in real be resolved if local conditions of countries accept.

According to results of Tehran Stock Exchange, only 14% of capital structure decisions are influenced by determinants considered in this study, however, just tangible assets and distance from bankruptcy has effect on capital structure. Identifying reasons and resolve them based on local conditions is storage and high effective proposals. Managers also try to identify and eliminate reasons of lack of relationship between these factors within their firms. Compared between developing countries and Tehran Stock Exchange is seen that in size and of tangible assets are different; it means in other developing countries, impact of size and tangible assets on capital structure are different from Iran. It is desirable that a more careful

study be done that where are these differences? If there is a structural problem or behavior between firms, resolve them based on local conditions.

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