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The role of hierarchy in explaining capital structure of companies within the life cycle model

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ABSTRACT: The present study examines the role of hierarchical theory in explaining the capital structure of companies within the life cycle model of accepted manufacturing companies in Tehran stock exchange. Independent variable is capital structure and dependent variable includes the issued equity debt net and retained earnings and company size has been considered as control variable. The method of data collection is library and financial statements. The method of data analysis is correlation and multi regression test. The results show that the relationship between capital structure and debt net in the companies that are in the maturity and decline is stronger than the relationship between capital structure and debt net in companies that are in the growth stage. Also the relationship between capital structure and issued equity in companies that are in the growth stage is stronger than the relationship between capital structure and issued equity in companies that are in maturity and decline stage. Finally the relationship between capital structure and retained earnings in companies that are in maturity and decline stage is stronger that the relationship between capital structure and retained earnings in companies that are in the growth stage.

***Keywords*:** capital structure life cycle, debt net, issued equity earnings.

INTRODUCTION

Discussion of capital structure refer to how combine financial resources of company such as short- term debt net bonds, long- term debt, preferred stock and common stock. Some companies don't consider predetermined plan for capital structure and they change capital structure without a certain planning. Although the companies may achieve success in short- time but ultimately face to major problems for necessary funding for their activities. Such firms may not be able to have optimal use of their resources.

There for, one company should plan its capital structure in such that maximize its productivity and adapt its situation with the change easily (Hampton & others 2010, 167). Companies have to plan their initial capital structure when a profitable unit is established and launched and they have to affect the decisions of capital structure, when investment needs funding.

Autamy and his colleagues in 2012 studied the topic of capital structure and organizational life cycle among manufacturing companies in Indonesia. Haeri and colleagues in 2012 conducted a study with the issue of theoretical foundations of funding capital cost and capital structure. In this paper, the method of capital cost and related theories are addressed Mosavi and keshavarz conducted a study with topic studying the relationship between factors of capital structure and systematic risk classifications in the accepted companies in Tehran stock exchange in 2011. In this research this question is answered how companies change financing strategies when topic is systematic risk classification.

Thus, the required data of this research is collected from 99 active companies among all active companies in Tehran stock exchange in 1997- 1999 using Novin Rahavard software.

Research hypotheses

1. Capital structure of companies that are in the growth stage has a significant and positive relationship with debt net.
2. Capital structure of companies that are in the puberty stage has a significant and positive relationship with debt net.
3. Capital structure of companies that are in the wane stage has a significant and positive relationship with debt net.
4. Capital structure of companies that are in the growth stage has a significant and positive relationship with Shares outstanding
5. Capital structure of companies that are in the puberty stage has a significant and positive relationship with Shares outstanding
6. Capital structure of companies that are in the wane stage has a significant and positive relationship with Shares outstanding
7. Capital structure of companies that are in the growth stage has a significant and positive relationship with Retained Earnings.
8. Capital structure of companies that are in the puberty stage has a significant and positive relationship with Retained Earnings.
9. Capital structure of companies that are in the wane stage has a significant and positive relationship with Retained Earnings.

Break down stage s in "park and chen" method

1. The value of each variable for each firm- year is calculated.
2. Four variables were arranged according to year- Company. Then, they have been adapted to the story of take (1)
3. For each year- company a composite score is obtained that is classified in growth, maturity stage s given that the following conditions:

A) If the total score is between 12 and 24 in maturity stage
B) If the total score is between 24 and 36 in decline stage

Table 1. life cycle table of park and chen (2006)

	(AGE)	(SG)	(CE)	(DPR)
A third first	5	1	1	5
A second	4	2	2	4
A third third	3	3	3	3

From these, 28 companies are in the maturity stage and 30 companies are in the growth stage and 23 are in the decline stage.

The method used to collect data is documentive. In this research, the required data for hypotheses test have been collected by providing the required data from audited financial statements board reports for general assembly of sample companies and also Novin Rahavard and policy- processor software.

After collecting the data, calculations and classification of data for hypothesis test is conducted using spreadsheet program Excel. Then to test hypothesis software Eviewes is used.

MATERIALS AND METHODS

This research is descriptive- correlation and practical, because it is done by purpose of using these results in capital market.

Research model:

In this research, variables of retained earnings, debt net and issued equity are dependent variables budget deficit is independent variable and company size is control variable.

To investigate research hypothesis we show the relationship between research variables according to hierarchical theory within conceptual model.

To investigate the research question and given that the study that Rahim Utami conducted in 2012 and investigated this question in Malaysia, the following models are proposed.

Net Debt issue: $a + b_1 \times \text{deficit} + b^2 \times \text{size} + e$ model 1

Net Equity Issue: $a + b_1 \times$ deficit $+ b^2 \times$ size $+ e$ model 2
Net Retained Earning: $a + b_1 \times$ deficit $+ b^2 \times$ size $+ e$ model 3
.

RESULTS AND DISCUSSION

Testing and results

The question that often arises in practical studies is whether there is evidence of the ability to integrate data or model is different for all sectional units. Therefore you should check that is there heterogeneity or individual differences between levels? If there is heterogeneity panel data approach is used and otherwise, the method of combined data with least squares approach is used to estimate model for this purpose, f lymr test is done. In this test H_0 hypothesis of equal intercepts (combined data) is opposite of H_1 hypothesis of anisotropy intercepts (panel data). If it was found that the studied sections are heterogeneous and have individual differences, panel methods are more suitable, for choice between fixed and random effects, Housman test is used. Housman test statistic is calculated to determine fixed or random differences of cross sections; it has a chi – square with degrees of freedom equal to the number of variables.

Table 2. F lymr test (some intercept points)

Result	p-value	DF	F	Model	Zero hypothesis
H_0 Rejected	0.000	2	2.64	1 Model	
H_0 Rejected	0.000	2	1.13	2 Model	
H_0 Rejected	0.000	2	1.02	3 Model	
H_0 Rejected	0.000	2	1.52	4 Model	
H_0 Rejected	0.000	2	3.21	5 Model	Intercept of all levels are the same.
H_0 Rejected	0.000	2	2.97	6 Model	
H_0 Rejected	0.000	2	1.64	7 Model	
H_0 Rejected	0.000	2	3.13	8 Model	
H_0 Rejected	0.000	2	2.96	9 Model	

In F test: null hypothesis shows using combined data on opposite to using panel data considering that the significant level of above table, the result indicates that heterogeneous section and use of panel data are more suitable. After selection of panel data method using F lymr, Housman test is done. In this test if null hypothesis (H_0) is accepted, random effects model is used and if H_0 is rejected, fixed effects model is used.

Table 3. Results of Housman test (choice between fixed and random effects)

Result	p-value	DF	Chi	Model	Zero hypothesis
H_0 Rejected	0.000	2	5.45	1 Model	
H_0 Rejected	0.000	2	4.45	2 Model	
H_0 Rejected	0.000	2	4.34	3 Model	
H_0 Rejected	0.000	2	5.54	4 Model	
H_0 Rejected	0.000	2	4.75	5 Model	There is no difference in systematic coefficient.
H_0 Rejected	0.000	2	5.63	6 Model	
H_0 Rejected	0.000	2	5.83	7 Model	
H_0 Rejected	0.000	2	5.16	8 Model	
H_0 Rejected	0.000	2	4.45	9 Model	

The results show that the value of this statistic for each models is significant and the reported significant level at above table (p- value <0.5) indicated the rejections of H_0 at confidence level 95% for model, it uses fixed effects method.

The first hypothesis test

In this study first sub- hypothesis examines the relationship between capital structure and debt net of companies that are in the growth stage.
The result obtained from regression has been given in table (4):

Table 4. Results of multivariable regression of capital structure and debt net (growth stage)

Significant	t	Factor	Variable name	Symbol	variable Type
_	_	_	Net debt	Y	Dependent variable
0.025	1.64-	1.74-	Alfa	α	Constant
0.0021	1.99	*0.040	Capital Structure	X1	Independent variable
0.020	1.80	*0.62	Company Size		Dependent variable
_	_	*1.85	DW		
o.003	_	3.74	F		
_	_	0.443	The correlation coefficient	R	
_	_	0.197	The coefficient of determination	R Square	
_	_	0.196	Adjusted coefficient of determination	Adjusted R Square	

Significant level is equal to %5

As the figure shows there is significant relationship between capital structure and company size with debt net. Coefficient of variables shows that the relationship between company size and debt net is greater than the capital structure.

There is a significant and direct relationship between capital structure and company size with debt net, but this relationship between capital structure and debt net is minimal considering that the f statistic value of fitted regression model is significant and due to coefficient of determination. These variables explain 19.7% of changes of debt net.
Because Dorbin Watson statistic s between 1.5 to 2.5.
It can be said that there is no auto correlation problem between variables.

The second hypothesis test

In this research, second sub- hypothesis studies the relationship between capital structure and debt net of companies that are in maturity stage.
The result of regression has been given in table (5):

Table 5. Results of multivariable regression of capital structure and debt net (maturity stage)

Significant	t	Factor	Variable name	Symbol	variable Type
_	_	_	Net debt	Y	Dependent variable
0.002	1.54	1.76	Alfa	α	Constant
0.040	1.53	0.001	Capital Structure	X1	Independent variable
0.001	1.98	*0.645	Company Size		Dependent variable
_	_	*1.775	DW		
0.003	_	14.002	F		
_	_	0.668	The correlation coefficient	R	
_	_	0.446	The coefficient of determination	R Square	
_	_	0.445	Adjusted coefficient of determination	Adjusted R Square	

Significant level is %5

As the figure shows, there is a significant relationship between capital structure and company size (p- value <5%) with debt net. The coefficient of variables shows that the relationship between capital structure and debt net is greater than company size.

There is a significant and direct relationship between capital structure and company size with debt net and this relationship between capital structure and debt net in the maturity stage is strong.

Because Dorbin Watson statistic is between 1.5 to 2.5. It can be concluded that there is no autocorrelation problem between variables.

Considering that F statistic value of fitted regression model is significant and due to determination coefficient, these varibales explain 44.6% of changes of debt net.

The third sub- hypothesis test

In this research, the third sub- hypothesis examines the companies that are in decline stage. The result of regression has been given in table (6):

Table 6. Results of multivariable regression of capital structure and debt net (decline stage)

Significant	t	Factor	Variable name	Symbol	variable Type
_	_	_	Net debt	Y	Dependent variable
0.000	1.36	1.44	Alfa	α	Constant
0.00	1.118	*1.729	Capital Structure	X1	Independent variable
0.000	1.254	*0.387	Company Size		Dependent variable
_	_	1.89	DW		
o.003	_	6.987	F		
_	_	0.702	The correlation coefficient	R	
_	_	0.492	The coefficient of determination	R Square	
_	_	0.491	Adjusted coefficient of determination	Adjusted R Square	

Significant level is equal to %5

As the figure shows, there is a significant relationship between capital structure and company size (p- value <5%) with debt net. The coefficient of variable s shows that the relationship between capital structure and debt net is greater than company size.

There is significant and direct relationship between capital structure and company size with debt net and this relationship between capital structure and debt net in companies a decline stage in strong.

The fourth sub- hypothesis test

In the fourth sub- hypothesis the relationship between capital structure and issued equity of companies at the growth stage is examined. The result obtained from regression is given in table (7):

Table 7. Results of multivariable regression of capital structure and equity (growth stage)

Significant	t	Factor	Variable name	Symbol	variable Type
_	_	_	Shares outstanding	Y	Dependent variable
0.05	1.40	1.54	Alfa	α	Constant
0.003	1.95	*1.121	Capital Structure	X1	Independent variable
0.003	1.84	*0.745	Company Size		Dependent variable
_	_	1.921	DW		
0.001	_	0.695	F		
_	_	0.445	The correlation coefficient	R	
_	_	0.416	The coefficient of determination	R Square	
_	_	0.415	Adjusted coefficient of determination	Adjusted R Square	

Significant level is equal to %5

As the figure shows, there is a significant relationship between capital structure and company size (p- value <5%) with the issued equity. the coefficient of variables shows that the relationship between capital structure and issued equity is greater than company size.

There is a significant and direct relationship between capital structure and company size with the issued equity and this relationship between capital structure and issued equity in companies at growth stage is strong.

The fifth sub- hypothesis test

In this study, the fifth sub- hypothesis examines the relationship between capital structure and issued stock of companies that are in maturity stage. The results obtained from regression are given in table (8):

Table 8. Results of multivariable regression of capital structure and equity (maturity stage)

Significant	t	Factor	Variable name	Symbol	variable Type
_	_	_	Shares outstanding	Y	Dependent variable
0.001	1.05	2.100	Alfa	α	Constant
0.00	1.70	*0.050	Capital Structure	X1	Independent variable
0.001	1.535	*0.547	Company Size		Dependent variable
_	_	1.668	DW		
0.000	_	8.84	F		
_	_	0.600	The correlation coefficient	R	
_	_	0.36	The coefficient of determination	R Square	
_	_	0.35	Adjusted coefficient of determination	Adjusted R Square	

Significant level is equal to %5

As the figure shows, there is a significant relationship between capital structure and company size (p- value <5%) with the issued equity. The coefficient of variable shows that the relationship between company size and issued equity is greater than capital structure.

There is a significant and direct relationship between capital structure and company size with issued equity and this relationship between capital structure and issued equity is weak in the companies that are at maturity stage.

The sixth hypothesis test

The sixth sub- hypothesis examines the relationship between capital structure and issued stock of companies that are in decline stage.

The result of regression is given in table (9):

Table 9. Result of multivariable regression of capital structure and issued equity (decline stage)

Significant	t	Factor	Variable name	Symbol	variable Type
_	_	_	Shares outstanding	Y	Dependent variable
0.000	1.113	1.58	Alfa	α	Constant
0.002	1.44	*0.039	Capital Structure	X1	Independent variable
0.000	1.229	0.398	Company Size		Dependent variable
_	_	1.796	DW		
0.000	_	4.54	F		
_	_	0.581	The correlation coefficient	R	
_	_	0.337	The coefficient of determination	R Square	
_	_	0.337	Adjusted coefficient of determination	Adjusted R Square	

Significant level is %5

As the figure shows, there is significant relationship between capital structure and company size (p- value <5%) with issued equity. The coefficient of variables shows that the relationship between company size and issued. Equity is greater than capital structure.

There is significant and direct relationship between capital structure and company size with the issued equity. This relationship between capital structure and issued stock is weak in companies that are in maturity stage.

The seventh sub- hypothesis test

The seventh sub- hypothesis examines the relationship between capital structure and retained earning that are in the growth stage.

The result of regression is given in table (10)

Table 10. result of multivariable regression of capital structure and retained earnings (growth stage)

Significant	t	Factor	Variable name	Symbol	variable Type
_	_	_	Retained Earnings	Y	Dependent variable
0.020	1.900	1.56	Alfa	α	Constant
0.0021	1.473	*0.600	Capital Structure	X1	Independent variable
0.000	1.79	*0.845	Company Size		Dependent variable
_	_	2.001	DW		
0.001	_	42.123	F		
_	_	0.843	The correlation coefficient	R	
_	_	0.696	The coefficient of determination	R Square	
_	_	0.695	Adjusted coefficient of determination	Adjusted R Square	

Significant level is equal to %5

As the figure shows, there is a significant relationship between capital structure and company size (p- value <5%) with the retained earnings. The coefficient of variables shows that the relationship between company size and retained earnings is greater capital structure.

There is a significant and direct relationship between capital structure and company size with the issued equity and the relationship between capital structure and the retained earnings is medium in companies that are in the growth stage.

The eighth sub- hypothesis test

The eighth sub- hypothesis test examines the relationship between capital structure and retained earning that are in maturity stage.

Result of regression is given in table (11):

Table 11. Result of multivariable regression of capital structure and retained earnings (maturity stage)

Significant	t	Factor	Variable name	Symbol	variable Type
_	_	_	Retained Earnings	Y	Dependent variable
0.001	1.64	1.94	Alfa	α	Constant
0.002	1.68	*0.779	Capital Structure	X1	Independent variable
0.001	2.003	0.746	Company Size		Dependent variable
_	_	2.11	DW		
0.00	_	4.98	F		
_	_	0.812	The correlation coefficient	R	
_	_	0.660	The coefficient of determination	R Square	
_	_	0.659	Adjusted coefficient of determination	Adjusted R Square	

Significant level is equal to %5

As the figure shows there is a significant relationship between capital structure and company size (p- value <5%) with retained earnings. The coefficient of variables shows that the relationship between capital structure and retained earnings is greater than company size.

There is a direct and significant relationship between capital structure and company size with equity and this relationship between capital structure and retained earning is strong in companies of maturity stage.

The ninth hypothesis test

In this research, the ninth sub- hypothesis test examines the relationship between capital structure and retained earnings of companies that are in decline stage.

The result of multivariable regression is given on table (12):

Table 12. Results of multivariable regression of capital structure and retained earnings (decline stage)

Significant	t	Factor	Variable name	Symbol	variable Type
_	_	_	Retained Earnings	Y	Dependent variable
0.000	1.012	1.72	Alfa	α	Constant
0.001	1.49	0.603	Capital Structure	X1	Independent variable
0.000	1.11	0.593	Company Size		Dependent variable
_	_	2.19	DW		
0.000	_	7.57	F		
_	_	0.776	The correlation coefficient	R	
_	_	0.602	The coefficient of determination	R Square	
_	_	0.601	Adjusted coefficient of determination	Adjusted R Square	

Significant level is %5

As the figure shows, there is a significant relationship between capital structure and company size (p- value <5%) with retained earnings. The coefficient of variables shows that the relationship between capital structure and retained earnings is greater than company size.

There is a significant and direct relationship between capital structure and company size with the issued equity and earnings is strong in companies that are in decline stage.

Considering that F statistic value of fitted regression model is significant and due to the coefficient of determination these. Variables explain 60.2 of changes of the retained earnings.

Over all the results show that the hierarchical theory shows financial models of mature companies and decline stage better than growing companies in Tehran stock exchange.

The results of this research are consistent with the results Daskalaxis and silaki (2005) and Molayz (2007) research, because in these researches, they concluded that companies of maturity and decline stage follow hierarchical theory to provide financial deficit. The results of this study are inconsistent with the results of Utami

(2012) research. Because they concluded that the companies at the growth stage follow hierarchical theory and financial model companies of mature and decline stage is uncertain.

Suggestions

According to evidence obtained from this study and the results of hypothesis test suggestions for Tehran stock exchange, management of companies, shareholders, creditors, banks and credit institutions, students and researchers are as follows:

1. Given that the results of first hypothesis, it is suggested that shareholders and investors who intend to inter into capital market and invest on shares of companies must pay attention into stage s of life cycle because in each one of stage s of growth, maturity and decline they use different methods to eliminate the financial deficit. Investors must in each stage s according to their investment purpose. According to first hypothesis, companies of growth stage follow the hierarchical theory and achieve to success.
2. According to the results of second hypothesis, it is suggested that the management of companies pay attention to financial performance of companies in the growth maturity and decline and they follow the capital structure of companies that has high financial performance.

According to that share herders invest on companies of growth stage if the annual divided profit is important for them, because these companies more divide the earning and using retained earnings for eliminating the budget deficit is in the last priorit.

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