Companies Life Cycle Stages and Capital Structure in Emerging Markets: Evidence from Iran

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Abstract

Purpose − The current research examines the effect of life cycle stages on capital structure of listed companies in Tehran Stock Exchange.

Research design, data, methodology − By aid of 685 year-company data, which collected from financial statements of companies during 2006-2012, first, the companies, are classified into three groups including companies in growth, maturity and decline stages. After removing the companies, which were not in accordance with life cycle model, 86 companies were selected to test two main hypotheses of the research.

Results − The results show that the capital structure of the sample companies is different in various life cycle stages. More investigation by LSD test also revealed that the total debt to total assets ratio means of the companies in growth stages were significantly different from those companies in maturity stages and those in growth stages had high level of debt to assets ratio.

Conclusions − The result showed the average amount of the working capital for companies in three stages are significantly different and due to high level of operation of the companies in maturity and decline stages, these companies held high amount of working capital than those in the growth stages.

Keywords : Life Cycle Stages, Optimal Capital Structure, Leverage Ratios, Working Capital Management.

JEL Classifications : N20, N25, N85, O23.

1. Introduction

Nowadays regarding continues development of financial instruments

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besides increasing compotation in business operation environment, correct and sound financial policy setting especially capital structure to achieve strategic objectives get the vital attitudes of the all companies. Often main studies around the condition of the capital structure in companies done in developed countries, which is not comparable with research in less developed countries. By considering that achieving to high level of capital market efficiency need to optimal capital allocation, it is necessary to do studies along ways to led optimal capital structure. Hence, current study is willing to examine the condition of capital structure of listed companies in Tehran Stock Exchange by considering their life cycle position.

2. Research Problem

Nowadays capital structure subject was determined as an efficient factor in valuation and handling of the companies in capital markets. Current variable environment of the business operation make corporations credit ranking depended on attention to their capital structure and it get necessary their strategic planning to achieve the objective of maximizing of the stockholders wealth (Drobetz & Fix, 2003) One of the economic features of companies is their various life cycle. According to life cycle theory, companies have specific behavior around life cycle stages from standpoint of the financial and economic respect. In the other word, the features of financial and economic condition of the companies are affected by the stage of the life cycle that companies placed there (Xu, 2007). The entities from their foundation time get expires\ various stages of the life cycle and according the condition of each of the Furth stages must take especial decision. The above-mentioned stages are not comprehensive, however they can provide a suitable framework for assessing, designing same as developing of financial strategies. One important factor in taking of strategies is attending to the fact that the company is operation in which stages of their life cycle including start-up, growth, maturity stage or decline stage and attitude of current study is that whether capital structure of the companies is affected of their life cycle of the operation. Those entities which are operating at growth stage, because of there is operating in initial years of life cycle, often have low profitability and high out flow of the cash flow. Those companies, which operation in maturity stage, emphasize on keeping and improving of their performance. Profitability at this stage is usually high and companies in order to strengthen their positions are willing to distribution much dividend and they have less opportunity to investment and grows and don't need to extra fund try to divide the

profits in order to and that they are faced by less growth and have less need for financial security. Regarding what said, it seems that firms make different decisions at all stages of start-up, growth, maturity and decline about financial security policies and will consequently have different capital structures. Current research tries to respond to question whether the capital structure of a firm affected by different stages of life cycle. That is why firms are divided into three groups; firms at the stage of growth, firms at the stage of maturity and firms at the stage of decline (emerging stage is ignored). All research hypotheses were tested.

3. Importance and necessity of the study

Concerning financial security of companies and condition of the capital structure, contribute to creation of an outlook on their subsequent profitability, competitive ability and activities. Minimizing cost of capital and increasing firms' stock value are the subject of many discussion in financial management and ways they companies choose and develop their financial policies has constitute many debates in this area. By considering of the financial management literature, it can be seen that major reason for companies' financial failure is their insufficient investment (Cassar, 2004). On the other hand, using the outlook of life cycle, we understand that the method we apply to assess and describe an organization cannot necessarily be used to assess and describe the same organization in the future. The measures adopted for resolving one problem at the stage of growth is obviously different from the measures adopted to resolve the same problem at the stage of decline. Paying attention to firms' life cycle and their financing decisions at different life cycle stages shows the importance of their capital structure. Financial manager plays a key role in minimizing capital costs and achieving optimal capital structure. Financial managers along various life cycle stages must take appropriate financial strategies. Regarding the importance of capital structure in maintenance and keeping on during their life cycle, it is necessary to examine the level of effectiveness of companies' capital structure on changing their life cycle stages.

4. Literature review

4.1. Capital structure

Capital structure is referred to the combination of different financial resources for each company (DeAngelo et al, 2011). There are many studied, conducted regarding crucial factors in combining capital structure and how financial resources are combined. More than half century ago, Weston (1955) came up with the discussion of how to combine firms' financial resources. Last theories in side of companies' financial structure introduced firstly by Miller and Modigliani (1958). Before their theory, there were no comprehensive theories around on capital structure. Miller and Modigliani (1958) assumed in their theory that each company can produce some cash flow, where a

firm chooses a specific ratio of debts and equity for financing of its assets; in fact, it decides how to distribute its expected cash flows among different equities holders. Similarly, it is supposed that investors and companies have equal access to financial markets in a way that investors can satisfy the companies' financial needs (ignoring the amount) and pay all unwanted liabilities. Regarding what was said, Modigliani and Miller (1958) concluded that each company financing from issuing debts or stock do not have any effect on their valuation however (Miller, 1977; Auerbach & King, 1983). Publication of their article besides clarification of current issues on this area led to formation of new argument and ambiguities around that too (Frank & Goyal, 2007). During the years after issuing of Miller and Modigliani's article, various studied done and conducted their issue on lot of criticism. Real word evidence also had not supported their theory and finally caused them to stand up on their theory by issuing new article in 1963 which they take some adjustments. Some of these adjustments include tax saving of issuing Loan and effects on cost of financing methods on value of the company. In summary, it is importance the examination of crucial factors in determining capital structure. Most studies concerning the firms' financing have tried to explain circumstances under which capital structure have affect on firm value.

4.2. Nature of the life cycle stages

Adizes (1989) states that living creatures such as plants, animals and human all over follow determinant life cycle. These creatures are born, grown, get old and finally pass away. These living systems at each stage of their life cycle have particular behavioral patterns in order to cope with issues of that stage and issues related to transfer from one stage to another. The theory of the firms' life cycle, assumes that firms and economic entities, like all living creatures that are born, grow and die, have life cycle stages. According to Xu (2007), one of the firms' economic features is their life cycle. According to life cycle theory at all stages of life cycle, firms have particular modes and behaviors of both financial and economical. That is a firm's financial and economic features is affected by stage of life cycle at which the firm is been operating. Like living creatures, growth and decay of entities indicated through the relationship between flexibility and control. During the young period, entities are often flexible but uncontrollable in most case. After getting old, the firms' relations change and control increase while flexibility decline. However, along that oldness is accompanied by loss of controllability. Hence, passing of life is not the reason for growth and decay. Many long-lived firms are considered young or old. It is not passing life that causes growth and decay of firms. Being young means a firm easily changes and it is at the lowest level of control due to loss of predictability. When economic entity is flexible and controllable, this indicates it is not too young or old and has the advantages of youth altogether. This condition is known as the ''Prime Period''. Such entity is capable of changing direction, pursuing the change the way it wants and bringing what it whishes under control. Figure 1 shows the relation between flexibility and control of the some entities.
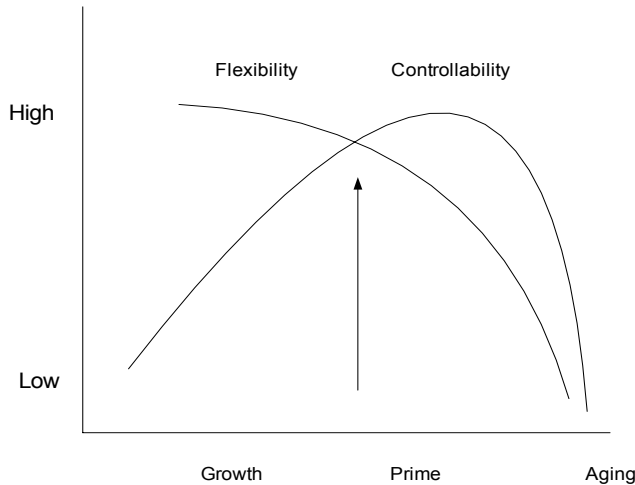
<Figure 1> The relation between flexibility and control in entities life cycle stages

By growing and then deicing of the firms, shortcomings that have led them to flexibility, because they become self-control too. Growth means capability of facing bigger and more complicated problems. Thus, the duty of management is guiding the firm in a way that makes it capable of moving to the next stage of life cycle. Getting old means decrease in capability of facing the problems that the firm has been faced for years. As the firm come to oldness, the above-mentioned problems seem being increasingly irresolvable. However, the process of getting old can be delayed. For this objective management must try to create conditions in which growth or youth is strengthened in a way that lead the entity to perfection and maintain that position (Adizes, 1989).

4.3. Classification of the life cycle stages

Start-up stage: In this stage, the amount of assets (firm size) is usually on the low level and cash inflows from operational and profitable activities isn't considerable and that firms need high liquidity in order to fulfill growth opportunities and gain financial advantage. The dividend paid ratio in these firms is relatively low and internal rate of return (IRR) compared to cost of capital rate is also less.

Growth stage: In this stage, size of the firm is larger than other firms at start-up stage and level the of sales and incomes is also high in relation to start-up stage. Company resources are often invested in capital assets and the firm is more flexible around liquidity criteria. The dividend paid ratio in these firms usually is fluctuating between 10% and 50% and the internal rate of return often exceeds cost of capital rate.

Maturity stage: In this stage, firms have satiable profitability and companies provide their needed fund through internal resources. The size of assets are proportionately larger than size of the firms at the growth stage. The dividend paid ratio in these firms is fluctuating between 50% and 100%. Due to excess of liquidity and less dependence upon external financing, the internal rates of return in these firms are equal or more than cost of capital.

Decline stage: In these stage growth opportunities is usually low.

Profitability, liquidity and obligation settlement criteria's' going to decline and the firm is in distress because of the increasing competition. Financing costs from external resources are high in way that in most cases the internal rate of return is less than costs of capital.

4.4. Literature review

Teker (2008) studied the relation between macroeconomic variables and capital structure of 119 firms listed in securities exchange organization during 2002 to 2007 years. They showed there is a meaningful relation between level of country export and capital structure, but there was no meaningful relationship among amount of liquidity, imports and internal gross production with capital structure of Iranian market. Ibrahim (2009) evaluated the effect of the composition of capital structure on performance of companies' during1997 to 2005 years. They report that the composition of capital structure has little effect on performance of investigated companies.

Xu (2007) investigates the effect of life cycle stages in evaluation of risk and performance factors. The results obtained from investigation of 518 firm-years data during the years of 2001 and 2007 showed that relevance of risk and performance factors. They investigated the relation of the companies' life cycle stage and conservatism in corporate valuation. In this regard, the Kousenidis (2005) found that variables of life cycle stages and firm size were efficient factors in relationship between profitability and return.

Guney et al. (2010) examined the data obtained from Chinese companies during the 1994 to 2006 years in 12 different industries. Their findings indicate there is a meaningful difference between debt ratios of firms in different industries. Their results also showed that the relationship between debt ratio and products of competitive market is not liner relationship dependent on the type of industry, size and opportunities of growth of the corporate. By going time, the Chinese firms try to adjust their debt ratio.

Aharoni et al. (2008) compared descriptive potential of factors based on cash flows and accruals items to explain value of the firm at different life cycle stages. They found that generally both cash based accounting same as accruals based accounting have little informative content. However regarding which stage of life cycle the firm is at, the power of accruals based accounting description is more than factors based on cash based accounting.

Kallunki and Silvola (2008) showed that usage rate of Activity Based Costing systems because of the change in managers needs differs and upon to level of the applying this system in maturity stage is higher than those companies in growth stage.

5. Research hypotheses

Due to the importance of the study, research problem and research objectives, the following hypotheses are postulated on ground of theoretical bases:

Main hypothesis: Position of the corporate life cycle stage has impact on composition of their capital structure.

First sub hypothesis: in various life cycle stages, Capital structure of the firms that evaluated upon debt to asset criteria is different.

Second sub hypothesis: in various life cycle stages, Capital structure of the firms, which evaluated upon their working capital amount criteria, is different.

6. Research Methodology and Sample

The current research is willing to apply present knowledge of financial management around capital structure to develop effect of the corporate life cycle stage variable on way of capital composition; hence, it is classified as applied research. On the other hand, because we do not tend to change the condition of the study variables and only investigated them upon their condition, so the suitable research method is descriptive. However, the nature of the applied data in this research is historical. By considering the research objective and hypothesis, the population of the research includes all of the companies, which listed in Tehran Stock Exchange. In order to choose suitable sample to test research hypotheses we take some condition, which includes:

1. The company should be listed in Tehran Stock Exchange before the 2006.
2. The company's financial period led to end of the December and has not been changed during the period of the research.
3. That company do not been classified as a bankrupt firms upon the list of Tehran securities exchange organization bankrupt firms.
4. The company not be classified as investment companies and do not operating in banking industry.
5. Financial statement of the sample companies are presented regularly and research information and data was be accessible easily.

6.1. Research variables evaluation methods

6.1.1. The way of classifying companies upon their life cycle stage

In current study, we used a suitable model to classify sample companies upon their life cycle stages, which developed firstly by Anthony and Ramesh (1992). This model is gained of three factors to classify companies in various life cycle stages, including sales growth, capital expenditures and divided paid ratio. Due to change in characteristics of reporting entity of the some firms because of consolidation, hence the variable of "age" about companies has been ignored. So:

1. Firstly, amounts of the three variables for all of the sample companies are calculated for each year. Further, these amounts are sorted and classified to three classes as minimum, medium and maximum.
2. A grade is given to each of the observations in the three categories (minimum 1, medium 2, maximum 3).
3. Then for each year of the firm, there is one compound grade, which is classified under one of the growth, maturity and decline stages.

4. Finally, observations, which are not based on the variables in the framework of life cycle model, are removed from the primary sample and the rest ones make the final sample.
5. In this study the companies in Start-up stage was ignored due to inaccessibility of those companies information.

Table 1 shows the result of the model, which is the independent variable:

<Table 1> Life Cycle Stages Model

Life cycle stage	SG	DPR	CE
Companies in Growth stage	3	1	3
Companies in Maturity stage	2	2	2
Companies in Decline stage	1	3	1

Where:

SG_{it}: Sale growth $[(Sale_{it} / Sale_{it-1}) -1] \times 100$

CE_{it}: Capital Expenditures (Addition (decrease) of fixed assets of company$_{it}$ / market value of the company $_{it}$)$\times 100$

DPR_{it}: Divided Paid Ratio (DPS_{it} / EPS_{it})$\times 100$

6.1.2. The way of handling Companies' Capital Structure

To measure capital structure of the firms as a dependent variable of the research, we gained of two criterions including debts to assets ratio and net working capital amount.

7. The results of hypotheses test

Along to study objectives we used 685 firm- years' data along period for 6 years from 2006 – 2012. The data, which were not in accordance with framework of life cycle model, were eliminated and finally 86 cases were selected to test research hypothesis. After that, the amount of the debts to assets ratio and working capital as dependent variable for each of 86 cases was calculated.

<Table 2> Descriptive Statistical of the variables

Dependent variable Capital Structure	Independent variable Life Cycle Stage	N	$\overline{X}$	MD	MO	SD	Min	Max
Debt to asset ratio	Growth stage	30	0.697	0.697	0.370	0.168	0.370	1.064
	Maturity stage	33	0.599	0.629	0.346	0.135	0.346	0.818
	Decline stage	23	0.618	0.633	0.307	0.162	0.307	0.913
Net Working Capital	Growth stage	30	-0.038	-0.014	-0.355	0.158	-0.355	0.247
	Maturity stage	33	0.142	0.176	-0.231	0.158	-0.231	0.465
	Decline stage	23	0.108	0.082	-0.318	0.194	-0.318	0.450

Mean of debts to assets ratio in each three groups of sample firms are positive. However, Net working capital in growth and maturity stages are negative and in decline stage are positive. Why net working capital amount of the firms are negative is due to the adoption of audacious working capital policy by the above-mentioned firms.

7.1. The results of first sub- hypothesis test

The first subsidiary hypothesis tries to trace whether the capital structure of the firms are affected because of their different life cycle stage. The statistical explanation of this hypothesis is as follows:

$$\begin{cases} H_0: & \text{Capital structure of the firms, which evaluated upon their debt} \\ & \text{to asset criteria in various life cycle stages, are different} \\ H_1: & \text{Capital structure of the firms which evaluated upon their debt} \\ & \text{to asset criteria in various life cycle stages are not different} \end{cases}$$

$$\begin{cases} H_0: & u_1 = u_2 = u_3 \\ H_1: & \text{at least a case average differs from others.} \end{cases}$$

Where u_1, u_2 and u_3 are the mean of debts to assets ratio for sample firms in growth, maturity and decline stages. Because of the Comparing median of several groups, the most appropriate way to evaluate is the one-way variance analysis. The results are showed in Table 3.

<Table 3> Result of the hypothesis test by help of the Analysis Of Variance statistical method (ANOVA)

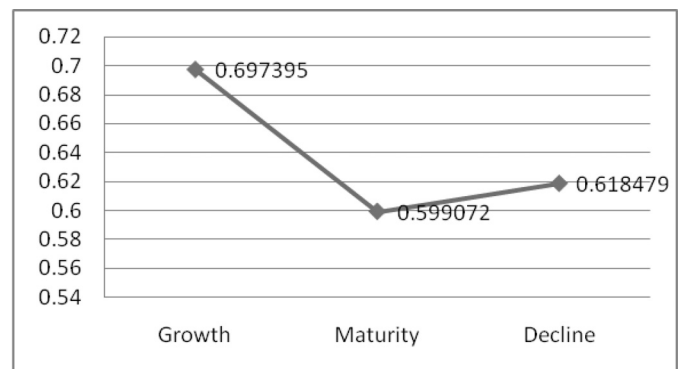| Hypotheses	Change factor	Sum of Squares	Df	Mean Square	F	P-value	Test result
First subsidiary hypothesis	Between groups	0.165	2	0.082	3.449	0.036	H0 rejected
	Within Groups	1.980	83	0.024			
	Total	2.145	85				
Second subsidiary hypothesis	Between groups	0.559	2	0.279	9.866	0.000	H0 rejected
	Within Groups	2.351	83	0.028			
	Total	2.910	85				

According to test results of the hypotheses in Table 3, capital structure of the firms measured by ratio of debts to assets is meaningfully different at different stages of life cycle. To find out which factor caused the difference LSD test was conducted and the results are shown in Table 4.

According to the results of LSD test, mean of the firms' capital structure based on debts to assets ratio have meaningful differences in two growth and maturity stages. It indicates that capital structure of the firms in growth stage is more leverage. This conclusion is in accordance with past findings of Degryse et al. (2012) and Byoun (2011).

They showed that firms in growth stage to provide their financial needs take loans due to low cost of financing from issuing debt compared to issuing stock, more over it has tax advantages of paying interests and also capability to maintain control of the firm by current shareholders. Thus, companies in this stage have high level of leverage ratios. As firms are passing different stages of life cycle and are maturity one, they are faced by new situations at this stage. Such as decrease of growth opportunities, while increasing of business risk, so them to strengthening their position of the firms in this stage turn the financing method of issuing debt to use internal resource and rationed earning and issuing stock and this trend continues to the decline stage. Consequently, capital structure of the firms changes and led from high to low and medium leverage. However, this subject is shown in Figure 2 below.
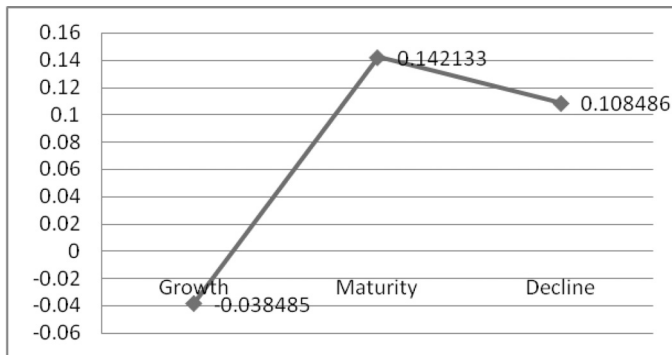

<Figure 2> Median of the firm's capital structure in different stages of life cycle measured according to debts to assets ratio

7.2. The results of second subsidiary hypothesis test

Like the first subsidiary hypothesis, the second hypothesis also are willing to trace whether working capital of the companies as an index of capital structure analysis are effected by different stages of life cycle (growth, maturity and decline). Statistical explanation of the second hypothesis is just like the first one. Results of the comparing mean of three groups by help of the analysis of variance statistical method (ANOVA) for this hypothesis that was shown in Table 3 indicates that there is meaningful difference between working capital

<Table 4> Results of the LSD Test around comparison mean of criteria hypothesis in studied groups

hypothesis	Compared groups	Compared groups Criteria	Difference of means	Sig	Test result	Analysis of causes of difference
First subsidiary hypothesis	Decline & Maturity	u_2, u_3	0.01941	0.64	Difference is not meaningful	Capital structure of the firms at the growth stage evaluated by help of debts to assets ratio is different from those capital structure of firms in maturity stage
	Decline & Growth	u_1, u_3	0.07892-	0.06	Difference is not meaningful	
	Maturity & Growth	u_1, u_2	0.09832	0.01	Difference is meaningful	
Second subsidiary hypothesis	Decline & Maturity	u_2, u_3	0.03365-	0.46	Difference is not meaningful	Working capital of firms in growth stage is different from those firms in stage maturity and decline stages
	Decline & Growth	u_1, u_3	0.14697	0.00	Difference is meaningful	
	Growth & Maturity	u_1, u_2	0.18062	0.00	Difference is meaningful	

amount of three groups of companies in growth, maturity and decline stages. The results was shown in Table 4 suggest that firms held different working capital amounts in various stages of life cycle. Although firms in growth stage have low working capital amounts due to low level of operations, companies in maturity and decline stags, held high working capital amounts compared due to high level of operations. This conclusion is in accordance with previous findings of Byoun (2011). Figure 3 shows the details of the study.

<Figure 3> Median of the firm's capital structure in different stages of life cycle evaluated by net working capital amount

8. Conclusions and suggestions

According to results of the hypotheses test, capital structure of firms in various stages of life cycle is different due to difference of their operations and financing polices in each stages to achieve their objective of shareholders wealth maximizing. Firms in the growth stage of life cycle because of the continents increasing of their activities and low cost of issuing of debt prefer to take loan to fulfill their financial needs. Hence, their debts to equity ratios comparing to those companies in maturity and decline life cycle stages is usually high. Moreover, companies in maturity and decline life cycle stages, have high level of working capital amount compared to those companies in growth stage of life cycle due high level of operations and activities. Upon to results of the research, it is recommended to all participants of capital market such as analysts and stockholders same as other users of financial information to   take in account, importance of life cycle stages factors as they evaluate performance of firms especially in capital structure evaluation. Correct evaluation of performance and comparison of financial status and structure of firms requires attention to life cycle stages of the firm. This attention enhances the quality of decision-making and provides the condition on wise decisions making. In conducting the current research and measuring its hypotheses due to difficulty of measuring actual age of firms, this factor was ignored, also because of informality of firms in start-up stage in evolution of the life cycle they were ignored. However, future researchers must take in account the limitations of current research results.

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