**International Journal of Technical Research and Applications** e-ISSN: 2320-8163,
www.ijtra.com Special Issue 29 (August, 2015), PP. 1-7

# CAPITAL STRUCTURE AND FIRMS LIFE CYCLE IN TEHRAN STOCK EXCHANGE

Saeid Jabbarzadeh Kangarlouei[1], Mohammad Soraya Keshtiban[2],Morteza Motavassel[3]
Department of Accounting,
Urmia Branch, Islamic Azad University, Urmia, Iran.
[1]Jabbarzadeh.s@gmail.com

***Abstract*— This research aim to investigate the relationship between capital structure and firms life cycle in Tehran Stock Exchange. Sample of research consists of 187 firms listed in Tehran Stock Exchange during the period between 2007 to 2013. In this study, firms are divided into two groups of growing firms and mature firms and firm's capital structure consisted of net debt, retained income and equity capital. The results show that the effect of financing deficiency on net debt in growing firms is more than mature firms. In addition, growing firms follow Pecking Order Theory (TOT) more than mature firms but it is insignificant**

*Index Terms* — **Capital structure, firm's life cycle and Tehran Stock Exchange.**

## I. INTRODUCTION

One of the important issues in financial research is to determine how firms finance in their life cycle. Considering information asymmetry, firms have different conditions in thire life cycle for financing. Traditionally, firm's life cycle fall into four stage namely start-up or emerging stage, grow-up or growth stage, maturity or stability stage and decline or stagnation stage. Following Utami and Inanga (2012), in this research firms are divided into two group of growth stage and maturity or stability stage. Firms in their maturity or stability stage have less information asymmetry than firms in maturity or stability stage because firms in maturity or stability stage are normally older firms and have been scrutinize by financial analysis and investors and they are well-known and then should have less information asymmetry.

On the other hand, capital structure emphasizes on the distribution of left side of balance sheet including long term, short term financing such as debentures, bonds, bank and trade credits, commercial papers, preference share capital and equity capital. Simply stated, it combines equity capital and debt capital that to attain the goals of the firm (Ahmad et al., 2010).

Why firms choose differing combinations of debt and equity to finance their operations is one of the most critical issues in finance, but research on capital structure has not reached a conclusion. The main theories have identified some general factors to explain the level of equity or debt. However, their predictions for some of the factors are exactly the opposite. On the other hand, during the last years firm's life cycle theory developed in finance to explain the changing economic and financial behavior of the firm along its life (Castro et al., 2012).

Financing theories and specifically Pecking Order Theory (POT) argue that firms with more information asymmetry should follow POT in financing decisions. In general, the difference between firms in growth stage and firms in maturity or stability stage is that mature firms are older, more stable, more earnings and less growth opportunity. Firms in mature stage engage in bond issuance, loan taking to reduce information asymmetry because they have less growth opportunity. In this study the emphasis is on POT. This theory argues that firms use existence resources in stage to stage that mean when they have financing needs, they use the resources with less cost (Utami and Inanga, 2012). Simply stated, when firms internal cash flows is insufficient to make investment and pay dividend, firms engage in financing through debt and they do not issue stock unless debt financing has a high cost and cost of financial crisis is high (Shyam-Sunder and

Myers, 2005). In real world, decisions as to capital structure are based on judgment. However, theoretical understanding is necessary for rationalizing judgment about capital structure (Ahmadi, 2001).

Considering theses arguments, the study is to investigate the relationship between capital structure and firms life cycle in Tehran Stock Exchange.

*A. Literature review*

Kim and Suh (2009) present results manifesting that low-RE firms have low leverage because of their heavy reliance on external equity due to financial constraints, (ii) medium-RE firms have high leverage because of their active use of debt in funding high growth, and (iii) high-RE firms have low leverage because of their ability to generate internal funds that exceed funding requirements.

Castro et al. (2012) show that capital structure explanatory factors evolve across the life cycle stages, changing or rebalancing the prevalence of the static models in play, trade-off, pecking order, and market timing.

Utami and Inanga (2012) investigated the relationship between capital structure and firm's life cycle and show that financing has a positive significant effect on net debt and net equity in both firms in growth stage and mature stage while it does not affect retained earnings.

Min-Shik et al. (2010) indicate that firms in mature stage pay more cash dividend.

Bulan and Yan (2009) show that firms in mature stage can receive loan with less cost because they have high return.

Black (2008) investigates the relationship between income and cash flows with firm's value in their different life cycle. They indicate that in growth and decline stages, cash flows are more relevant than income and in mature stage vice versa.

Rajan (2005) manifests that firms in mature stage can receive loan with low cost which may lead to higher and stable income.

Asta and Geytasi (2012) show that the amount of using discretionary accruals is different stages of firm's life cycle in that the amount of using discretionary accruals in growth stage is more than mature and decline stage.

karami and Omrani (2010) investigated the effect of firms life cycle and conservatism on firms value. Their results show that during the period between 2003-2009, investors emphasize more on net operating assets and non-regular operating income in growth stage than mature stage and decline stage.

Hagigat and Gorbani (2007) studied the relationship between income and cash flows with firm's value with an emphasis on firm's life cycle. Their results show that in growth and decline stages, the correlation of cash flows with firm's value is more significant than the correlation between income and firms value. In addition, value relevance of income is more significant than value relevance of cash flows.

*B. Hypotheses development*

Main hypothesis: growing firms follow POT more than mature firms.

First sub-hypothesis: the effect of financing deficiency on net facilities in growing firms is more than mature firms.

Second sub-hypothesis: the effect of financing deficiency on net equity in growing firms is more than mature firms.

Third sub-hypothesis: the effect of financing deficiency on retained earnings in growing firms is more than mature firms.

*C. Methodology*

This research is applied and post hoc study since verity of financial information users may utilize its results. Considering that study tries to find a

significant relationship between research variables, it can be considered as descriptive correlation research. Data of firm's information is gathered from TSE database and hypotheses are tested using Eviews software.

POPULATION AND SAMPLE

The population of the study consists of all firms listed in Tehran Stock Exchange. However, to reach a uniform sample, following conditions are posited on sampling:

1-The fiscal year must be ended at the end of Esfand (solar last month) and must not have changed its fiscal year during studied period.

2-Financial information must be available and firms must not be investment, brokerage or insurance company.

As a result of these conditions, 187 firms are selected to be studied during the period between 2007 to 2013.

*D. Model and variables*

To test research hypotheses, following models are regressed two times, one time for growing firms and the second time for mature firms and the results are compared.

Bulan and Yan (2009) argue that firms are in their growing period in the first 6 year and then became mature.

Net Debt Issue = $a + b_1$ Deficit + e

Net Equity Issue = $a + b_1$ Deficit + e

Net Retained Earning = $a + b_1$Deficit + e

Net Debt Issue = $a + b_1$ Deficit + $b_2$ Deficit + e

Deficit is financing deficiency which is calculated as following:

Financing deficiency =dividend +expenditure +net working capital +net paid loan-operating cash flow

Net Debt Issue is changes in received loans calculated as previous year loan minus current year loan

Net Equity Issue is changes in equity calculated as previous year equity minus current year equity.

Net Retained Earning is retained income calculated as previous year retained income minus current year retained income.

All variables deflated by total assets.

*E. Empirical results*

*Descriptive statistic*

Descriptive statistic of research variables is shown in Table 1, 2 and 3.

**Table 1. Descriptive statistic for firms in growth stage**

| | financing deficiency | Changes in debt | Changes in equity | Changes in retained earnings |
|---|---|---|---|---|
| Observation | 168 | 168 | 168 | 168 |
| Median | -0.10 | 0.00 | 0.04 | 0.03 |
| Mean | -0.06 | 0.01 | 0.07 | 0.04 |
| Coefficient of variation | -7.33 | 7 | 2.14 | 2.75 |
| Standard deviation | 0.44 | 0.07 | 0.15 | 0.11 |
| Max | 1.30 | 0.27 | 0.67 | 0.39 |
| Min | -1.19 | -0.20 | -0.43 | -0.31 |

**Table 2. Descriptive statistic for firms in mature stage**

| | financing deficiency | Changes in debt | Changes in equity | Changes in retained earnings |
|---|---|---|---|---|
| Observation | 805 | 805 | 805 | 805 |
| Median | -0.20 | 0.00 | 0.03 | 0.01 |
| Mean | -0.21 | 0.00 | 0.04 | 0.02 |
| Coefficient of variation | -2.2381 | 0.00 | 3.25 | 5 |
| Standard deviation | 0.47 | 0.06 | 0.13 | 0.10 |
| Max | 1.36 | 0.35 | 0.77 | 0.39 |
| Min | -1.85 | -0.26 | -0.44 | -0.32 |

**Table 3. Descriptive statistic for all firms**

| | financing deficiency | Changes in debt | Changes in equity | Changes in retained earnings |
|---|---|---|---|---|
| Observation | 973 | 973 | 973 | 973 |
| Median | -0.18 | 0.00 | 0.03 | 0.01 |
| Mean | -0.18 | 0.00 | 0.05 | 0.02 |
| Coefficient of variation | -3.12 | 1.21 | 3.06 | 4.61 |
| Standard deviation | 0.46 | 0.06 | 0.13 | 0.10 |
| Max | 1.35 | 0.34 | 0.75 | 0.39 |
| Min | -1.74 | -0.25 | -0.44 | -0.32 |

According to Tables 1, 2 and 3, firms in mature stage with the mean of 0.21 compared to firms in growth stage with the mean of 0.06 suffer more financing deficiency.

*F. Normality test*

To test the normality of research variables, Jarque-bera test is used which results are shown in Table 4.

**Table 4. Jarque-bera test**

| | Changes in retained earnings | Changes in equity | Changes in debt | financing deficiency |
|---|---|---|---|---|
| Jarque-bera | 119.7255 | 796.5861 | 1817.545 | 9.299936 |
| Sig. | 0.0861471 | 0.246887 | 0.2548961 | 0.572131 |

The results of Jarque-bera test shows that all research variables are normal considering that their significance is more than 5 percent confidence level.

*G. Hypotheses test*

*First sub-hypothesis*

The effect of financing deficiency on net facilities in growing firms is more than mature firms.

To test this hypothesis following model is regressed for firms in growth stage and firms in mature stage.

Net Debt Issue = a + $b_1$ Deficit + e

The results of this hypothesis are indicated in Table 5.

**Table 5. Results of first hypothesis test**

| | Mature firms | | | Growing firms | | |
|---|---|---|---|---|---|---|
| | Coefficient | t-Statistic | Prob. | Coefficient | t-Statistic | Prob. |
| C | 0.006 | 3.21 | 0.00 | 0.006 | 1.20 | 0.20 |
| DEF | 0.012 | 3.07 | 0.00 | 0.024 | 1.76 | 0.08 |
| Adjusted $R^2$ | 0.10 | | | 0.13 | | |
| $R^2$ | 0.11 | | | 0.19 | | |
| F-statistic | 9.44 | | | 3.10 | | |
| Sig | 0.00 | | | 0.08 | | |
| D.W | 2.01 | | | 2.02 | | |

Comparing the results of model regression for firms in growth stage and firms in mature stage indicate that the impact of financing deficiency on net debts in growing firms (0.024) is more than firms in mature stage (0.012). However, since F-statistic and financing deficiency for firms in growth stage are not significant in 95 confidence level, it cannot be concluded as to this hypothesis so the hypothesis is rejected.

Adjusted $R^2$ for mature firms is 0.10 while 0.13 for growing firms showing that independent variable more powerfully explains dependent variable in growing firms than mature firms. Durbin Watson (D-W) shows that there is not an autocorrelation problem among regression residuals since its value is between 1.5 and 2.5.

*H. Second sub-hypothesis*

The effect of financing deficiency on net equity in growing firms is more than mature firms.

To test this hypothesis following model is regressed for firms in growth stage and firms in mature stage.

Net Equity Issue = a + $b_1$ Deficit + e

The results of this hypothesis are indicated in Table 6.

**Table 6. Results of second hypothesis test**

| | Mature firms | | | Growing firms | | |
|---|---|---|---|---|---|---|
| | Coefficient | t-Statistic | Prob. | Coefficient | t-Statistic | Prob. |
| C | 0.067 | 15.02 | 0.00 | 0.063 | 6.58 | 0.00 |
| DEF | 0.119 | 13.68 | 0.00 | 0.141 | 5.44 | 0.00 |
| Adjusted $R^2$ | 0.18 | | | 0.28 | | |
| $R^2$ | 0.18 | | | 0.29 | | |
| F-statistic | 187 | | | 29.59 | | |
| Sig | 0.00 | | | 0.00 | | |
| D.W | 1.71 | | | 1.70 | | |

Comparing the results of model regression for firms in growth stage and firms in mature stage indicate that the impact of financing deficiency in net equity in growing firms (0.141) is more than firms in mature stage (0.119). In addition, the coefficients are significant in 99 confidence level proving the hypothesis.

Adjusted $R^2$ for mature firms is 0.18 while 0.29 for growing firms showing that independent variable more powerfully explains dependent variable in growing firms than mature firms.

Durbin Watson (D-W) shows that there is not an autocorrelation problem among regression residuals since its value is between 1.5 and 2.5.

*I. Third sub-hypothesis*

The effect of financing deficiency on retained earnings in growing firms is more than mature firms.

To test this hypothesis following model is regressed for firms in growth stage and firms in mature stage.

Net Retained Earning = $a + b_1$ Deficit + e

The results of this hypothesis are indicated in Table 7.

**Table 7. Results of third sub-hypothesis**

| | Mature firms | | | Growing firms | | |
|---|---|---|---|---|---|---|
| | Coefficient | t-Statistic | Prob. | Coefficient | t-Statistic | Prob. |
| C | 0.031 | 8.57 | 0.00 | 0.038 | 4.82 | 0.00 |
| DEF | 0.067 | 9.54 | 0.00 | 0.100 | 4.69 | 0.00 |
| Adjusted $R^2$ | 0.10 | | | 0.16 | | |
| $R^2$ | 0.10 | | | 0.16 | | |
| F-statistic | 91.14 | | | 22.08 | | |
| Sig | 0.00 | | | 0.00 | | |
| D.W | 1.8 | | | 1.17 | | |

Comparing the results of model regression for firms in growth stage and firms in mature stage indicate that the impact of financing deficiency on retained earnings in growing firms (0.100) is more than firms in mature stage (0.067). In addition, the coefficients are significant in 99 confidence level proving the hypothesis.

Adjusted $R^2$ for mature firms is 0.10 while 0.16 for growing firms showing that independent variable more powerfully explains dependent variable in growing firms than mature firms. Durbin Watson (D-W) shows that there is not an autocorrelation problem among regression residuals since its value is between 1.5 and 2.5.

*J. Main hypothesis*

Growing firms follow POT more than mature firms.

To test this hypothesis following model is regressed for firms in growth stage and firms in mature stage.

Net Debt Issue = $a + b_1$ Deficit + $b_2$ Deficit$^2$ + e

The results of this hypothesis are indicated in Table 8.

In the case that firms use debts for their financing firstly and then use share issuance, power of financing deficiency will be negative and otherwise positive (Utami and Inanga., 2012).

**Table 8. Results of main hypothesis**

| | Mature firms | | | Growing firms | | |
|---|---|---|---|---|---|---|
| | Coefficient | t-Statistic | Prob. | Coefficient | t-Statistic | Prob. |
| C | 0.006 | 2.66 | 0.00 | 0.012 | 1.53 | 0.12 |
| DEF | 0.014 | 2.93 | 0.00 | 0.021 | 1.46 | 0.11 |
| DEF^2 | 0.003 | 0.65 | 0.50 | -0.025 | 0.93 | 0.21 |
| Adjusted $R^2$ | 0.09 | | | 0.19 | | |
| $R^2$ | 0.12 | | | 0.18 | | |
| F-statistic | 4.93 | | | 2.028 | | |
| Sig | 0.00 | | | 0.03 | | |
| D.W | 2.01 | | | 1.78 | | |

Comparing the results of model regression for firms in growth stage and firms in mature stage indicate that financing deficiency for firms in mature stage is positive while it is negative for firms in growing stage. This shows that firms in growing stage follow POT more than mature stage. However, because of insignificance of financing deficiency for firms in growing stage and mature stage, it cannot be concluded as to this hypothesis and it is rejected.

Adjusted $R^2$ for mature firms is 0.12 while 0.19 for growing firms showing that independent variable more powerfully explains dependent variable in growing firms than mature firms. Durbin Watson (D-W) shows that there is not an autocorrelation problem among regression residuals since its value is between 1.5 and 2.5.

*K. Discussion and conclusion*

This research aim to investigate the relationship between capital structure and firms life cycle in Tehran Stock Exchange. Sample of research consists of 187 firms listed in Tehran Stock Exchange during the period between 2005 to

2011. In this study, firms are divided into two groups of growing firms and mature firms and firm's capital structure consisted of net debt, retained income and equity capital. To capture the aim of the study a hypothesis with three sub-hypotheses are developed.

First sub-hypothesis supposes that the effect of financing deficiency on net facilities in growing firms is more than mature firms. Comparing the results of model regression for firms in growth stage and firms in mature stage indicate that the impact of financing deficiency on net debts in growing firms (0.024) is more than firms in mature stage (0.012). However, since F-statistic and financing deficiency for firms in growth stage are not significant in 95 confidence level, it cannot be concluded as to this hypothesis so the hypothesis is rejected. However, in 90 confidence level, it is shown that firms in growing stage have more tendency to finance through debts. This indicates that young firms in Iran have more tendency to finance through debt because they have more investment opportunity and simply they can obtain more return than mature firms do. This result is consistent with the results of Utami and Inanga (2012).

Second sub-hypothesis argues that the effect of financing deficiency on net equity in growing firms is more than mature firms. Comparing the results of model regression for firms in growth stage and firms in mature stage indicate that the impact of financing deficiency in net equity in growing firms (0.141) is more than firms in mature stage (0.119). In addition, the coefficients are significant in 99 confidence level proving the hypothesis. Firms in growth stage have great need for financing, therefore they are more intended to finance through debt and equity than mature firms. The results of this hypothesis also prove this fact.

Third sub-hypothesis manifests that the effect of financing deficiency on retained earnings in growing firms is more than mature firms. Comparing the results of model regression for firms in growth stage and firms in mature stage indicate that the impact of financing deficiency on retained earnings in growing firms (0.100) is more than firms in mature stage (0.067). In addition, the coefficients are significant in 99 confidence level proving the hypothesis. These results indicate that young or growing firms are more intended to finance through retained earnings than mature firms because they have more investment opportunity and retained earnings is the cheapest way of financing. Therefore, growing firms are inclined to invest funds of retained earnings instead of distribute it. This result is inconsistent with the results of Utami and Inanga (2012).

Main hypothesis supposes that growing firms follow POT more than mature firms. Comparing the results of model regression for firms in growth stage and firms in mature stage indicate that financing deficiency for firms in mature stage is positive while it is negative for firms in growing stage. This shows that firms in growing stage follow POT more than mature stage. However, because of insignificance of financing deficiency for firms in growing stage and mature stage, it cannot be concluded as to this hypothesis and it is rejected. In the case that firms use debts for their financing firstly and then use share issuance, power of financing deficiency will be negative and otherwise positive (Utami and Inanga., 2012). This result is inconsistent with the results of Utami and Inanga (2012).

Considering the results of the research, it is suggested to firm's managers that consider their firms life cycle stage in financing decisions. In it also suggested to investors that consider firms life cycle and capital structure in their investment decisions because of their interactions.

## REFERENCES

1) Ahmed, N., Ahmed, Z., Ishfaq Ahmed, I. (2010). Determinants of Capital Structure: A Case of Life Insurance Sector of Pakistan, European Journal of Economics, Finance and Administrative Sciences 24, pp. 7-12.

2) Black E. L. (2008). Life-Cycle Impacts on the Incremental Relevance of Earnings and Cash flow Measures. Journal of Financial Statement Analysis; 40-56.
3) Bulan, L.T., and Yan, Z. (2009). The Pecking Order of Financing and the Firm's Life Cycle. Banking and Finance Letters, pp.1-16.
4) Castro, P. C., Tascón, M.T., Amor-Tapia, B.(2012). The role of life cycle on capital structure. Working paper.
5) Hagigat, H., Gorbani, A, (2007). The relationship between income and cash flows with firm's value with an emphasis on life cycle, Business management horizon journal 6.
6) Karami, G., Omrani, (2010). The effect of life cycle and conservatism on firm's value, accounting and audit research 59, pp. 79-96.
7) Kim, B., Suh, J. (2009). Financial Life Cycle and Capital Structure, Working paper.
8) Min-Shik, S., Kwon, J.S., Kim, S.E. (2010). Earned Surplus and Dividend Policy: Test of the Financial Life Cycle Theory in Korean Capital Market, International Research Journal of Finance and Economics 59, pp. 86-100
9) Osta, S., Geytasi, R., (2012). The effect of firm's life cycle on discretionary accruals, financial accounting researches 4, pp. 89-104.
10) Rajan R.G., Zingales, L. (2005), What do we know about capital structure? Some evidence from international data", The Journal of Finance, No. 50, pp. 1-58.
11) Shyam-Sunder, L. and S. Myers, (1999), "Testing Static Tradeoff against Pecking Order Models of Capital Structure," Journal of Financial Economics 51, 219-244
12) Utami, S. R., Inanga. E. L, (2012). The Relationship between Capital Structure and the Life Cycle of Firms in the Manufacturing Sector of Indonesia, International Research Journal of Finance and Economics 88, pp. 69-91.