A SURVEY ON THE EFFECTS OF CAPITAL BUDGETING AND COST OF CAPITAL ON THE CAPITAL STRUCTURE (CASE STUDY: FIRMS ACCEPTED IN TEHRAN STOCK EXCHANGE)

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ABSTRACT

The aim of this study is to analyze the effects of capital budgeting and capital costs on the capital structure of firms accepted in Tehran stock exchange. The statistical population of this research is covering firms accepted in Tehran stock exchange from 2008 to 2014. By using a random sampling methods, 110 firms were selected for this study. The research is correlation semi-experimental in nature and content and multi-variable regression method with a 95% degree of certainty was used to analyze the results. The results show that investment budgeting can affect the capital structure more than investment costs.

Keywords: Financial leverage, capital budgeting, capital Costs, Capital structure

INTRODUCTION

The issue of capital structure is one of the most challenging and repeatedly discussed issues in financial and business divisions of companies. Researchers have always tried to offer different theories and ideas in order to enlighten a way to determine a premium capital structure which minimize the capital costs and maximize its value (Haugen et al. 2011). Since one of the most important goals and objectives of financial managers are to increase the share values of the stockholders, they need to consider the best possible combination of financial resources for the company which is also called capital structure. Financial managers constantly ruminate and pay attention to the relationship between capital costs, capital structure and total value of the company. That is because capital structure can influence on the value of the firm or company (Alievar et al, 2009). On the other hand, capital budgeting is one of the most important parts of the management decisions. The importance of the utilized resources and the needed time to restore the investment requires detailed and precise analysis and the best judgment. Investment’s costs bring about long term duties and obligations to recollect and restore future interests. These costs can determine and reflect the main aims of business sectors, and they may fortify the long term commercial condition of the firm. Since the benefits of capital costs are obtained in a fairly long term period, the flaws in the management decisions can lead to heavy losses (Garika and et al., 2010). Hence, this paper tends to study the effects of capital budgeting and capital costs on capital structure in Firms Accepted in Tehran Stock Exchange.

2-1 Review of the Literature

Capital budgeting is a process of spotting, evaluating and supporting the grand investing projects in organizations. Decision making in capital budgeting directly influences the success and achievements of the organization in approaching and obtaining the aims, so capital budgeting plays a functional role in attaining the long-term goals, as well as the organization’s achievements and success. The proper control of the capital costs needs accurate investigation and assess of demands and requests. Managerial controlling requires receiving data on such issues as engineering estimations, expected sales and production and distribution costs. Managers are always responsible for matching the organization’s activities with long term goals and objectives of the organization; furthermore, they also tend to make sure about the financial and business success of the organization’s projects (Alievar et al, 2009). Since
the capital assets are used in long term periods, financial resources should be provided from long term resources like long-term loans, stocks and shares and other financial assets and resources (Haugen et al. 2011). Though there are different factors affecting investment budgeting, the main factors are economic conditions, growth and expansion policies, risk evaluations and conceptual elements and factors (Shabahang, Reza; 2011). Also, there are different methods to evaluate the long term projects. The main ones are as follows:

1- Discounted cash flow method. This method is related to the time value of money or monetary time value in which investment return rate or investment’s cost rate is used to discount the future cash flows. In this way, the current value of the cash flows happening at different times can be estimated and it is possible to compare different projects in the present (Shabahang; Reza2011).

A. The net present value (NPV). The net present value of an investment project consists of the difference between the expected present value of cash outflows and the present value of the cash flow inlet. Evaluating the cash flows and investment outflows, capital cost rate or expected interest rate is used for this evaluation which is computed as follows:

\[ NPV = \sum_{t=1}^{n} \frac{CF_{AT}}{(1 + k)^t} - I \]

\( CF_{AT} \) = Net cash inflows in t period
\( K \) = Discount rate that is equal to the investment cost rate or expected return rate
\( I \) = Primary outflows
\( N \) = The expected life of the project

B. Profitability index (PI). Profitability index is a ratio of dividing the current value of future cash flow inflots on investing costs. If a profitability index of a project is bigger than 1 (\( PI \geq 1 \)) then it is proper for investing (Shabahang, Reza; 2011).)

C. Internal Return Rate (IRR). Internal Return Rate is a discounted rate in which the net present value of the project is equal to zero (Aliievar and Shabahang, 2009).

2- Non-Discouned Methods

Although discounted cash flows are common for evaluating the investment projects, some managers prefer to use other methods. Some of the managers’ preferences are as follows:

A- Payback Period Method
The payback period is a time period in which primary investment is returned back or paid back by future cash flows. If the annual cash flow inlet of a project is the same with those expected in the future, the return time period of the investment can be calculated by dividing the primary investment (Fadaienezad, 2001). The majority of managers believes that investment recovery period is a criterion for evaluating the risk because the fund or money, which is supposed to be obtained in the near future is much more assured and certain than the fund or money supposed to be obtained in long term period or distant future (Aliievar and Shabahang, 2009).

B- Payback Reciprocal Method
This method is a dividing the numerical figure 1 by investment payback or return back period. This method is an easy and approximate method to evaluate the present return rate.

C- Accounting Return Rate
This rate is calculated by dividing the average net profit by average invested. Then, the profitability of the project can be shown based on a part of used investment when this rate is figured on an annual basis (Margaritis; et al., 2011).

3-1 Cost of Capital

Deciding and judging in selecting the premium method of investing in order to maximizing the wealth of stockholders is one of the main considerations of managers in financial management (Norawesh, 2002). One of the common methods to increase the value of the organization and wealth of stockholders is to select or to combine the long term financial resources (Margaritis; et al., 2011). Deciding on the type of financial providing and capital structure of an organization plays an important role in welfare and financial stability of the organization. A wrong decision on providing the funds and capital structure can cause many limitations and it even can lead to the breakup or bankruptcy of the firm (Hart and Grossman., 1982). Thus, decision making about fund providing is one of the most important decisions in managerial level. A
right and considerate decision regarding the fund providing allows the firm to enjoy staying in the competitive environment (Arbabian and Grayeli, 2009). Since the business world is so complicated and intricate one, managers play an important role in attaining the premium capital structure. Also, as it is difficult to select a proper level of the financial leverage, financial managers have to regulate fund providing methods to increase or maximize the wealth of the firm. Accordingly, the firms need strategies to decrease the investment costs, increase the investment return and in turn the set of decisions lead to increase in value of the company (Maquieira; et al., 2012). In short, the capital cost rate is a minimum return which doesn’t change the value of the firm (Panahian and Mojtabahi, 2008). Managers who are representatives of the shareholders should try their best to regulate the capital structure of the company by which they must minimize or decrease the investment costs and maximize or increase the value of the company and the shareholders’ wealth (Poorhaidari, 1995). The following formula is commonly used to estimate the capital costs’ weighted average of a company (Shirzadeh 2004).

\[ WACC = \sum_{i=1}^{n} w_i \times k_i \]

Expected return \( K_i \), \( i=1,2,\ldots,n \)

\[ W_i = \text{weight} \]

\( i \) = capital source

\( i \) is a capital resource when there are two sources of investment, including long term loan with normal interest and stock. So it can be written by this equation:

\[ WACC = W_d k_d (1-t) + W_s K_s \]

\( k_d \) = interest rate of long term loan

\( T \) = Income tax rate of the company

\( K_s \) = Normal shares Expected cost rate

\( W_d, W_s \) = weights of long term loans and normal shares in the capital structure of the firm

4-1 Capital Structure

Capital structure means the combination of liabilities and laws of shareholders, including the left items in the balance sheet (Yazdani., 1994). Cooper defines capital structure as a ratio of older exchange to the sum of the all investments. Harris believes that the balance structure between normal shares, preferred stocks and related subdivisions, retained earnings and combination of borrowings is called capital structure in a company which is used to fund raising or fund providing. Belkau defines capital structure as quantitative claims for the company’s assets. The main aim of decision making for the capital structure is to maximize the market value of the company by an optimal combination of company’s financial resources. Called the optimal structure of the capital, this combination tends to minimize the average rate of investment costs in a company (Baghrzadeh., 2001). The mystery of capital structure is one of the key issues in financial management because managers have a little knowledge in the field of capital structure. From the viewpoint of financial management, determining the relationship between investment costs, capital structure and firm’s value is a crucial issue because firm’s value can be influenced by capital structure (Abor, 2005). The investment cost is a minimum rate of return which a firm should acquire in order to meet the stockholder’s and investment suppliers return benefit and maintain the present value of the firm. The total value of the company can be calculated with a subsequent formula:

\[ V_f = V_d + V_q \]

\( V_f \) = Total value of the company

\( V_d \) = Value of the liabilities

\( V_q \) = Value of shareholders share or interest

5-1 Methodology

This paper tends to apply Macuire and friends method to evaluate investment budgeting (2012). This method was first used in Latin America to investigate the relationship between investment budgeting, investment costs and capital structure. This method has been defined as follows:

\[ \text{LATAM}_{i,t}(\text{size+ LEV+ IND+ TAR+QUE } + \text{FAR+DIVE+ REG+ DCF}) \]
Size = Size equals the size of the firm and it is calculated by using a normal logarithm of the total value of the firm’s assets.

LEV = LEV means the financial leverage of the firm which is calculated by dividing the total liabilities on the total value of the firm.

IND = IND equals to the activity of the firm in the industry. If the industry or the company’s activity is in a productive field, IND equals 1, otherwise it would be zero.

Tar = Tar equals to the reaching the beneficial aims of the firm and it is calculated in this way: the average of the sum of the firm’s earnings during the years of study are calculated. If the average of the benefits in a special year is more than the mean, then it is marked as 1, otherwise it would be 0.

Que = Que equals to the variety of company’s products. If the firm produces a variety of goods and products, the Que would be 1; otherwise, in a case he firm produces single product or good the Que would be ranked 0.

For = Number 1 is a rank for the companies with exporting and 0 is for those that do not export their products.

Div = If the company pays the annual stock interest in a determined year, the number would be 1 and otherwise it would be 0.

Reg = Reg is a ranking to show the changes in market price. If the changes in market price in the investigation year are less than 25% the figure would be counted as 0, while the changes higher than 25%

Def = Def equals to the present value of cash flows. This value is calculated by dividing the net cash flows taken from operational activities of the next year on the book value of the total assets.

The following equation is used to investigate the effect of investment budgeting on capital structure:

\[
\text{LEV}_{i,t} = B_0 + B_1 \text{LATAM}_{i,t} + B_2 \text{proInd}_{i,t} + B_3 \text{senCF}_{i,t} + e_{i,t}
\]

\text{LEV}_{i,t} is a financial leverage which is estimated by dividing the total book value of liabilities on total book value of assets.} B_1 \text{LATAM}_{i,t} \text{is an investment budgeting that the way of calculating was mentioned in the previous section.} proInd_{i,t} \text{is a profitability index of the company} i \text{ in the time} t \text{ which is calculated by dividing the net tax deducted profit/loss on shareholders’ interest (Glen and Sing, 2004).} \text{senCF}_{i,t} \text{is a margin of cash flows in the company} i \text{ in the time period of} t. \text{The net cash flows are multiplied in artificial variable of cash flows to calculate this item. Calculating the net cash flows, the net cash flows taken from operational activities are divided on the total book value of the assets.}

Investigating the effect of investment costs on capital structure, the following equitation is used:

\[
\text{LEV}_{i,t} = B_0 + B_1 \text{CvE}_{i,t} + B_2 \text{XERP}_{i,t} + B_3 \text{proInd}_{i,t} + B_4 \text{senCF}_{i,t} + e_{i,t}
\]

\text{CvE}_{i,t} \text{equals to normal stock investment cost and it is calculated by using the following formula:}

\[
K = \frac{D(1+g)}{P} + g
\]

\text{Ke is a normal stock capital cost}

\text{D is a divided interest of each normal share in the present year.}

\text{P is a market price for each share at the end of the present year.}

\text{g is an annual growth rate}

\text{g=(1-DPS/EPS)*ROE}

\text{RoE is a return rate of the shareholders’ interest which is calculated by dividing the taxed net interest of shares on the total interests of the shares.}

\text{Eps is the amount of interest for each normal share.}

The population of this study is the accepted firms in Tehran stock exchange and samples were selected by the systematic elimination method. Using this technique to sampling, the following criteria were considered in selecting data:

The financial year of the firm should be finished at the end of the solar year on Esafand.

There were not any changes in the financial year of the company from 1385 till 1390.

The firms should work as financial and investment companies, but not as stock brokers.
The companies shouldn’t have experienced loss during the study period. They need to be registered and accepted at the Tehran stock exchange before 2006.

The stock trading interruption in these firms should not have lasted more than two years. They have not been exited or signed out of the Tehran Stock Exchange during the period of investigation.

Table 1: The population of the study selected based on the eliminating method

<table>
<thead>
<tr>
<th>Description</th>
<th>Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>The total number of firms accepted in The Theran Stock Exchange till end of the 2011</td>
<td>150</td>
</tr>
<tr>
<td>The following numbers re subtracted from the total number</td>
<td></td>
</tr>
<tr>
<td>Firms that are accepted at the Tehran Stock Exchange during 2007 till 2011</td>
<td>132</td>
</tr>
<tr>
<td>Firms that are signed out from Tehran Stock Exchange during 2007 till 2011</td>
<td>26</td>
</tr>
<tr>
<td>Firms works in investment and financial sectors</td>
<td>37</td>
</tr>
<tr>
<td>Firms which their financial year is not finished at the end month of the solar year (Esfand)</td>
<td>54</td>
</tr>
<tr>
<td>Firms that have experienced loss during the study period</td>
<td>153</td>
</tr>
<tr>
<td>Firms that have experienced trading interruption more than two months</td>
<td>98</td>
</tr>
<tr>
<td>The Population</td>
<td>110</td>
</tr>
</tbody>
</table>

6-1 Findings and Results

The data in this study have gathered from Tehran Stock Exchange website, as well as the websites of the selected firms for this study. Descriptive date are summarized in table number 2.

Tabel 2: Descriptive data of the research variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Median</th>
<th>Standard Deviation</th>
<th>Minumum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Structure</td>
<td>0.681</td>
<td>0.6419</td>
<td>0.1669</td>
<td>0.0374</td>
<td>0.8998</td>
</tr>
<tr>
<td>Investment budgeting</td>
<td>2.121</td>
<td>3.2981</td>
<td>2.3071</td>
<td>0.6782</td>
<td>4.3271</td>
</tr>
<tr>
<td>Investment Costs</td>
<td>0.3712</td>
<td>0.3695</td>
<td>0.01477</td>
<td>0.1156</td>
<td>0.6285</td>
</tr>
<tr>
<td>Profitability Index</td>
<td>0.4532</td>
<td>0.4098</td>
<td>1.563</td>
<td>0.2091</td>
<td>0.6723</td>
</tr>
<tr>
<td>Cash Flow Sensitivity</td>
<td>0.5376</td>
<td>0.5460</td>
<td>0.778</td>
<td>0.8023</td>
<td>1.8315</td>
</tr>
</tbody>
</table>

Stability Investigation

Since the data in this study are gathered in a linear way, stability and reliability tests are taken before investigating the hypothesis. Testing the reliability, Im, Pesaran and Shin (2003), Levin and Lin (1992) tests were used and the results are shown in tables 3 and 4.

Table 3: Im, Pesaran and Shin (IPS)

<table>
<thead>
<tr>
<th>Variable/Statistics</th>
<th>Lev</th>
<th>LATAM</th>
<th>COE*ERP</th>
<th>Prolnd</th>
<th>Senef</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-Value</td>
<td>.0000</td>
<td>.0010</td>
<td>.0004</td>
<td>.0000</td>
<td>.0000</td>
</tr>
</tbody>
</table>
Table 4: Levin and Lin (LL)

<table>
<thead>
<tr>
<th>Variable/Statistics</th>
<th>Levi</th>
<th>LATAM</th>
<th>COE*ERP</th>
<th>ProInd</th>
<th>Sen cf</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-Value</td>
<td>.0000</td>
<td>.0000</td>
<td>.0469</td>
<td>.0000</td>
<td>.0010</td>
</tr>
</tbody>
</table>

Illustrated in the above table, since the p-value is less than 0.05, all the variables are in the proper variable level. Also, according to the results, mean and variance of the variables is stable during the study and covariance is stable in different years. Hence, using such variables in the model would not lead to fake regression.

Determining the Accuracy of Model

Determining the type of the model (modulation or panel), this study uses Chav and Hasman tests to detect whether the effects are accidental or stable. The results are summarized and shown in table 5 and 6:

Table 5: Chav Test

<table>
<thead>
<tr>
<th>Regression Model</th>
<th>F Statistics</th>
<th>Probability</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1</td>
<td>264.621</td>
<td>0.000</td>
<td>Hypothesis 0 Denial</td>
</tr>
<tr>
<td>Model 2</td>
<td>1.076</td>
<td>0.345</td>
<td>Hypothesis 0 Admission</td>
</tr>
</tbody>
</table>

The results in the table 5 show that regression model 1 (the effect of investment budgeting on capital structure) is a modular model and the second regression model (the effect of the investment costs of capital structure) is a panel model.

Table 6: Housman test

<table>
<thead>
<tr>
<th>Regression Model</th>
<th>F Statistics</th>
<th>Probability</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1</td>
<td>156.071</td>
<td>0.0000</td>
<td>Hypothesis 0 Denial</td>
</tr>
</tbody>
</table>

According to the above table, since the amount of probability is less than 0.05, the effects are stable so that the model 1 regression is a panel model with stable effect.

Normality of dependable variable distribution test

The Kolomogrof-Smironof test was used to test and investigate the normality of the dependable variable which the results are shown in table 7.

Table 7: Kolomogrof-Smironof

<table>
<thead>
<tr>
<th>Variable</th>
<th>K-S</th>
<th>Significance Level</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Structure</td>
<td>1.091</td>
<td>0.464</td>
<td>Normal Distribution</td>
</tr>
</tbody>
</table>

As the normal distribution shown in the above table, parametric test methods are used.

Test of independence of errors

Testing the independence of errors, Doorbin& Watson test was used and the results are summarized in table 8.

Table 8: Test of independence of errors

<table>
<thead>
<tr>
<th>Regression model</th>
<th>The coefficient of determination</th>
<th>The adjusted coefficient of determination</th>
<th>Doorbin and Watson test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1</td>
<td>0.642</td>
<td>0.617</td>
<td>1.925</td>
</tr>
<tr>
<td>Model 2</td>
<td>0.562</td>
<td>0.498</td>
<td>1.781</td>
</tr>
</tbody>
</table>
According to the above table, the amount of Doorbin and Watson for both of regression models is in 1.5 till 2.5 distant. Thus, the lack of self-correlation between errors is proved and using the regression method is possible.

**Variance Anisotropy**

Table 9: Results of unequal variances

<table>
<thead>
<tr>
<th>Description</th>
<th>White S</th>
<th>P-Value</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1</td>
<td>2.242</td>
<td>0.242</td>
<td>The absence of anisotropy</td>
</tr>
<tr>
<td>Model 2</td>
<td>2.354</td>
<td>0.176</td>
<td>The absence of anisotropy</td>
</tr>
</tbody>
</table>

The above results show the anisotropy among the model data, so they cannot be called as proper models.

**Hypothesis testing 1**

Hypothesis testing 1 states that investment budgeting can effect on the capital structure of the company. Testing this hypothesis, the following model is used:

\[
LEV_{i,t} = B_0 + B_1 \text{LATAM}_{i,t} + B_2 \text{proInd}_i + B_3 \text{sencf}_{i,t} + \epsilon_{i,t}
\]

The results of the test are shown in table 10 as follows:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient of variation</th>
<th>Coefficient</th>
<th>T-statistics</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant number</td>
<td></td>
<td>6.961</td>
<td>3.091</td>
<td>.006</td>
</tr>
<tr>
<td>CoEXErp_{i,t}</td>
<td></td>
<td>4.736</td>
<td>3.067</td>
<td>.011</td>
</tr>
<tr>
<td>proInd_{i,t}</td>
<td></td>
<td>-3.501</td>
<td>-2.987</td>
<td>.007</td>
</tr>
<tr>
<td>sencf_{i,t}</td>
<td></td>
<td>.818</td>
<td>.458</td>
<td>.281</td>
</tr>
</tbody>
</table>

The above table shows that f statistics of the Hypothesis testing 1 are proper models and according to the significance level, the investment budgeting variables and sensitivity of cash flows can effect on the capital structure. Since \( R^2 \) (Coefficient of determination) is 0.572, it is possible to claim that nearly 57% of the capital structure changes is determined by independent variables of the model. So, the regression model is as follows:

\[
LEV_{i,t} = 1.522 + 6.234 + \text{LATAM}_{i,t} + 2.467 \text{sencf}_{i,t}
\]

**Hypothesis testing 2**

The second hypothesis asserts that investment costs can effect on capital structure of the company. This hypothesis can be tested by the following model:

\[
LEV_{i,t} = B_0 + B_1 \text{CoEXErp}_{i,t} + B_2 \text{proInd}_i + B_3 \text{sencf}_{i,t} + \epsilon_{i,t}
\]

The results of the Hypothesis testing 2 are summarized in table number 11 as follows:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient of variation</th>
<th>Coefficient</th>
<th>T-statistics</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant number</td>
<td></td>
<td>6.961</td>
<td>3.091</td>
<td>.006</td>
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<tr>
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<td>-2.987</td>
<td>.007</td>
</tr>
<tr>
<td>sencf_{i,t}</td>
<td></td>
<td>.818</td>
<td>.458</td>
<td>.281</td>
</tr>
</tbody>
</table>
According to the results of the second hypothesis testing in table 11, F statistics and P-value, the regression model of the second hypothesis has been fitted in a proper way. Since the significant variable of sencc_{i,t} is more than 0.05, this variable has zero effect on capital structure. Also, as adjusted coefficient equals to 0.618, it is estimated that nearly 61.8% of the dependent variables change (capital structure) is determined by the independent variables. In addition, the profitability index variable is in reverse relation to capital structure. Finally, investment cost has a greater effect on capital structure rather than investment budgeting. The regression model of the second hypothesis is as follows:

$$\text{LEV}_{i,t} = 6.961 + 4.736\text{CoE} \times \text{REP}_{i,t} - 3.501 \text{proInd}_{i,t}$$

## RESULTS

Financing happens in different ways, including borrowing, issuance of shares and Income maintenance. Each of the aforementioned items has specific costs and income needs to be invested in the projects which the earning is more than the costs. Thus, financial managers strongly consider the relationship between investment costs, capital structure and the total value of the company because capital structure can influence the total value of the company. Since stockholders consider and react to the degree of financial risk changes, the optimal structure for the company’s investment can be determined (Yzdan, 1994). This study shows that investment budgeting has a meaningful effect on the capital structure in the accepted firms in Tehran Stock Exchanges with a 95% level of confidence. Increasing in each unit of investment budgeting can increase the capital structure of the studied companies about 6.234 units. The results of this study are compatible with those in Maquieira (2012), Mohammadi (2002), Hejazi (2005), Jafari and Sajadi (2006) and Hassan and Butt (2009). Also, the results show that investment costs can effect on the capital structure and escalating in each unit of the investment costs of the studied companies can lead to 4.736 unities increase in the capital structure of the companies. The obtained results of this research are compatible with studies done by Umutlu (2009), Varouj and et al., (2005) and Sung (2009).

## REFERENCES