

Cost of capital and free cash flows based on investment opportunities and different firms size

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Received: March 8, 2015

Accepted: May 10, 2015

ABSTRACT

By having financial sources of creditors and investors, the companies can fulfill their expectations. The mean capital cost is defined as the minimum return rate obtained by company to provide the expected return of investors in company. Two important factors of investment opportunities and firm size in funding and determining its policy and holding extra cash play important role. This study evaluated the relationship between common stock capital cost and free cash flow based on investment opportunities and different firms' size. To investigate this issue, the data of 94 companies listed on TSE during 2003 to 2013 are used. The results of hypothesis test showed that the relationship between free cash flow and capital cost in interaction with high investment opportunities was high and negative. However, in low investment opportunities, free cash flows had not significant effect on common stock capital cost. In the big companies, it is observed that the company reduces investment cost by its credit and absorbing capital but in small companies extra cash flows show lack of optimal allocation of resources and increase capital cost of common stock. In addition, investment opportunities, ability of extra liquidity and competitive power of companies can reduce capital and production application except in small companies can increase capital cost.

KEYWORDS: Capital cost of common stock, Investment opportunities, and Firm size

1-INTRODUCTION

Today, based on the importance and increasing development of capital markets in equipment and collection of individual small capitals to production activities, identification of the behavior of investors and effective variables on price and stock return in these markets are of great importance. Indeed, investors in stock market are important part of economy of the country and the highest capital is traded via stock markets around the world and national economy is considerably affected by stock market performance. Also, this market is available both for professional investors and public as an investment instrument. The transparent financial information is the main principle of responsiveness and informed economic decisions. Capital owners, creditors and other users need relevant and understandable financial information for decision making in purchase, stock holding, loan, evaluation of managers performance and other important economic decisions [1]. In addition, short-term planning in various fields is necessary for survival of economic units and taking effective decisions of investment and funding by managers, investors, creditors and others. Planning provides suitable use of existing opportunities and before encountering with unsuitable economic events, we can show good reactions. One of the duties of management is providing information for investors and analysts to help them in prediction of capital cost of common stock of companies. If the presented information is useful to explain return, the changes in presented data should change stock return of companies. The investigation of important factors of stock price changes can lead to the identification of explaining variables of price changes and finally improvement of investors' decisions and optimal allocation of resources. Indeed, by defining the important factors of stock price changes, the attitude of investors regarding the effective factors is corrected and due to true pricing, capital market attractions are increased and capital market is developed. In classic assurance world, in prices theory (micro economy), competition leads to zero economic earnings [2]. To compute economic profit, we should reduce return rate of capital market. Indeed, the efficient markets hypothesis is the continuance of equilibrium state of zero profit. In strong efficient markets. Securities are priced correctly and can reflect all the relevant information in market including confidential and available information. Also, it is assumed that the entire information is presented freely without limitation to all investors in capital market. In case of such information, those people having access to the information can use it for stock price forecast and abnormal return. Indeed, in order to achieve stable extra return, confidential information should exist or they should have specific ability to achieve abnormal return based on general information compared to other investors [3]. The issued financial statements by companies have information content. The legal restrictions for non-disclosure of confidential information or lack of trading permission and investment for those having access to confidential information is one of the methods of

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reduction of extra return in capital market. One of the features of strong efficient market is as stock price at each moment reflects intrinsic stock value based on existing and relevant information in market and there is no abnormal return in this market. Thus, if this abnormal return is reduced in the market, the efficiency of market is increased. Reduction of this extra return is possible via identification of relevant factors [4]. The investors are interested in high profit and reduced investment risk. Thus, they form the portfolio to reduce the risk via variety of investment or achieve highest return for definite level of risk. By formation of portfolio, non-systematic risk is eliminated. Non-systematic risk is the one in which the investor doesn't expect any reward. Thus, by diversification of investment, portfolio formation is eliminated. The selection of optimal portfolio needs an estimation of risk and stock return. Over many years, various models have been presented to evaluate risk and portfolio return. These models are evaluated differently and the results of test show that the raised factors in these models cannot explain the relationship between risk and portfolio return alone. Thus, the idea of combining these factors with each other was raised [5]. Thus, the idea of combining these factors was raised [5]. Profitability is one of the most important evaluation criteria of companies by investors. The reported profits of company are past data but we can evaluate the activities of company and its success based on them. The evaluation of opportunities and risks of commercial activities and management execution duty requires the perception of nature of commercial activity as profitability potential of business unit. Generally, the attraction of achieving of a company besides current condition of company depends upon its potential ability in creation of future incomes. The company that is profitable now and its profitability is continued in future is highly attractive compared to the company its potential profits are reduced. Generally, we can claim that the most important decision making criterion of investors to select the companies for investment is current and future profitability level of companies. Indeed, the investors in various strategies of investment decide based on the profit of companies [6]. Today, to attract the investors, the companies attempt to maximize the company value. The increase of income and growth in profit is one of the solutions considered in this regard. In TSE, the companies attempt to increase their annual profit and encourage the investors to investment in common stock. On the other hand, the investors in capital market attempt to direct their sources to the highest profitability. If the investors don't achieve their required profit, they exit the capital from stock market and invest in other activities and this leads to the reduction of stock trading and ignoring TSE. Thus, awareness of the risk of companies can play important role in decision making of people. In financial literature, risk is defined as the difference between actual return and expected return into two groups as: First, the risks relevant to internal factors of companies as management risk, liquidity risk, insolvency risk, etc. and it is called nonsystematic (reduction) risk. Second, it is the risks not attributed to one or some companies and they are associated to general conditions of market as economic, political, social conditions, etc. and it is called as systematic risk [7]. The set of investment opportunities is those acting as a predicting factor of company growth. The identified growth opportunities in new projects supported by development and research are necessary to implement a new project. These opportunities should be reliable and observed. The higher the indices of investment opportunities determined by groups or features of a company, the higher the reduction of mistakes in determining the company growth level. The investment opportunities have two basic features as first; investment opportunities show the projects with positive net present value. Second, the value of investment opportunities depends upon the future discretionary expenditures. Thus, investment opportunities show voluntary investment arising from production, investment and funding decisions and it is expected that their return rate is higher than common return. The set of investment opportunities of company is a list of projects with positive net present value available for company. There are many indices applied for measurement of the set of investment opportunities and some of them include: 1- The market value to book value ratio, 2- Market value to book value of equity, 3- Earnings per share, 4- Q Tobin. In free cash flow theory, extra money is mentioned as evaluation criterion of solvency as payment of debt in maturity depends upon the cash being held as extra. As the creditors of each company expect to repay their claims at maturity, for investment and crediting are much prepared compared to the companies with high free cash flow [8]. Polsen and Len [8] showed that free cash flow as internal funding source of companies is affected by two variables of investment opportunity and firm size. Also, in the companies with low investment opportunities, it is expected to have high free cash flow as in these companies, there are not many investment plans to use extra money. According to Jensen theory [9] there are two important factors of common investment opportunities and size in funding and determining debt policy and also in holding extra cash. According to this theory, it is expected of the company with low investment opportunities to have high free cash flows. The higher then investment opportunities (actual and potential), the majority of extra money is used to increase the wealth of investors and shareholders via investment in existing opportunities and the increase of investment from extra cash leads to the reduction of this cash. The firm size is the second important factor. The big companies are much more famous compared to small companies and it is expected that financial institutions and investors are more inclined to credit and investment in big companies. This issue (inclination of investors and creditors) affects extra cash flow and debt level. This study attempted to identify the relationship between free cash flows and debt by considering investment opportunities and firm size by existing information from TSE companies and attempted to answer the question "Is there any positive and significant association between capital cost of common stock and free cash flow in the companies with high investment opportunities? How is this condition interpreted regarding the companies with low investment opportunities? What is the difference of this relation in big and small companies?"

2-REVIEW OF LITERATURE

Talebnaet al. [10] evaluated the effect of agency problems of free cash flow on the relationship between earnings per share and book value of price of each share. The results of their study showed that earnings per share had positive and significant association with book value of price of each share and agency problems of free cash flow led into the reduction of the relationship between earnings per share and book value of price of each share. Habib[11] showed that the companies with positive free cash flows and considerable growth opportunities experienced the increase in value. In addition, the results showed that free cash flow had positive relation with stock return. Sajadi et al. [12] investigated the impact of audit quality on capital cost of common stock. They measured quality of audit by three indices of audit institution size, auditor specialization in industry and continuance of auditor selection. Their results showed that audit institution size had not significant effect on capital cost of common stock. However, auditor specialization in industry and continuance of auditor selection had negative relation with stock capital cost. Izadinia et al. [13] evaluated the relationship between operating cash flows, net profit and accruals component with future free cash flows of the companies listed on TSE. The results showed that operating cash flows compared to net profit had high capability in prediction of free cash flows. Also, adding accruals to operating cash flows model improved the prediction power of free cash flows. Kordestani and Alavi[14] evaluated the impact of accounting profit transparency on capital cost of common stock. They evaluated the financial data of 90 companies listed on TSE. Their findings showed that the companies with high profit transparency experienced less capital cost. Kordestani and Majdi[15] evaluated the relationship between qualitative features of profit and capital cost of common stock. This study evaluated the relationship between five qualitative features of earnings as earnings stability, earnings predictability, earnings relevance to stock value, timeliness and conservatism of earning with capital cost of common stock. The results of study supported the inverse relation between qualitative features of earnings as earnings stability, earnings predictability, earnings relevance to stock value, earnings timeliness and capital cost of common stock. This relation is significant statistically. However, there is no significant relation between conservatism of profit and capital cost of common stock.

3- Study question

Is there any positive relation between capital cost of common stock and free cash flows in the companies with high investment opportunities? How is this relation in the companies with low investment opportunities? Is there any positive relation between capital cost of common stock and free cash flows in the big companies? How is this relation defined in the companies with small size.

4- Study hypotheses

Investment opportunities are effective on the relationship between capital costs of common stock and free cash flows.

The firm size is effective on the relationship between capital cost of common stock and free cash flow.

5- Study methodology

The present study is empirical and ex post facto and it is based on actual and past data. This study is descriptive-correlation in terms of data collection. The main purpose is determining the amount and type of relation between tested variables. This study is applied in terms of purpose. The study population is all non-financial companies (manufacturing) listed in TSE since 2003 to the end of 2013. The study population is selected by screening and the following criteria: Type of company activity is manufacturing and the financial institutions, investment, banks, insurance, leasing and holding are not included in the study. The companies with maximum 6 months of trading pause in the study period. The fiscal year of end of Esfand and the fiscal period of companies is not changed in the study period. Their financial data are available from the beginning of fiscal year 2003 to the end of 2013 (Time scope) [16]. Book value of their equity is not negative. To achieve growth, the book value of equity should be positive. In addition, the observations with the changing data more than 30% are excluded to eliminate the effect of ownership, merging, bankruptcy, etc. Finally, 1034 years-company listed on TSE is selected after excluding the companies without information. The data is collected by library method and Rahvard Novin software and financial statements e valuation. Excel and Eviews software is used for data analysis. For hypothesis test and study statistical method, at first normality of data distribution is evaluated by Kolmogrov-Smirnov method. For hypotheses test, t-test is used. At confidence interval 95%, correlation relation is used to determine significance. Durbin-Watson statistics is used to evaluate auto-correlation of variables.

6- Data analysis method

For hypothesis test, four models are formulated and each of them is analyzed to support or reject the study hypotheses. In the first model, the first hypothesis, the relationship between capital cost of common stock and free cash flow in the companies with high investment opportunities can be evaluated.

$$r = \alpha_0 + \alpha_1 FCFHO_{it} + \alpha_2 L/TA_{it} + \alpha_3 SE/DE_{it} + \alpha_4 A/TA_{it} + \alpha_5 S/\sum S_{it} + \varepsilon_{it} \quad (1)$$

Second model is evaluated to test the first hypothesis in the companies with low investment opportunities.

$$r = \beta_0 + \beta_1 FCFLO_{it} + \beta_2 L/TA_{it} + \beta_3 SE/DE_{it} + \beta_4 A/TA_{it} + \beta_5 S/\sum S_{it} + \varepsilon_{it} \quad (2)$$

After the analysis of two above models, coefficients α_1 , β_1 are compared with each other and via model features as F Fisher and its significance level and adjusted coefficient of determination, the relationship between capital cost of common

stock in the companies with high investment opportunities and low opportunities can be compared. The aim of formulating the third model is testing the relationship between capital cost of common stock and free cash flow in big companies.

$$r = \partial_0 + \partial_1 FCFHS_{it} + \partial_2 L/TA_{it} + \partial_3 SE/DE_{it} + \partial_4 A/TA_{it} + \partial_5 S/\sum S_{it} + \varepsilon_{it} \quad (3)$$

Fourth model evaluates the relationship between capital cost of common stock and free cash flow in small companies.

$$r = \lambda_0 + \lambda_1 FCFLS_{it} + \lambda_2 L/TA_{it} + \lambda_3 SE/DE_{it} + \lambda_4 A/TA_{it} + \lambda_5 S/\sum S_{it} + \varepsilon_{it} \quad (4)$$

Like the evaluation of models 1, 2, after the analysis of two above models, coefficients ∂_1, λ_1 are compared and via model features as F Fisher and its significance level and adjusted coefficient of determination, the relationship between capital cost of common stock and free cash flow in big and small companies is compared.

Table 1- The variables and their calculation method

Calculations method	Sign	Name of variable	Type of variable
$r = \sqrt{(E_3 - E_2) / P_0}$	R	capital cost of common stock	Dependent
$FCF = (OI - TAX - INT - DIR + D) / TA$	FCFHO	High investment opportunities	Independent
	FCFLO	Low investment opportunities	
	FCFHS	Big companies	
	FCFLS	Small companies	
Book value of current and non-current debts/Total assets	L/TA	Investment opportunities	Control
Depreciation cost/wage cost	SE/DE	Capital or task consuming	
Total assets/ intangible assets	A/TA	Extra liquidity	
The sum of sale of active companies in industry/sale	S/∑S	Competitive power of companies	
Book value of current and non-current debts	L	Debt	Calculation
Total assets	TA	Asset	
$E_2(1 + Itg)$	E_3	Predicted profit of three future years	
Earnings per share predicted of two future years	E_2	Predicted profit of two future years	
$Itg = ROE(1 - DPS/EPS)$	Itg	Long-term growth	
The mean of return on equity two years ago	ROE	Return on equity	
Dividend to number of stocks	DPS	Dividend per share	
Earnings to number of stocks	EPS	Earnings per share	

7- Study findings

Before testing the hypotheses, descriptive indices of study variables are evaluated briefly in Table 1.

Table 2 shows the features of study variables. The first column defines that all data are evaluated for all studied variables in 1034 years company. In descriptive statistics, the study variables are computed for all variables, central measures and dispersion separately. Dependent variable of capital cost with 1034 observations has minimum, maximum and mean 0.0419, 1.068, 1.068, 0.2819. The values show that this variable follows normal distribution. The changes of mentioned variable distribution of data mean based on standard deviation statistics covers zero to 0.091. Based on positive coefficient of skewness coefficient 1.33, we can say the distribution of mentioned variable is skewed to right and the data density is inclined to right and the relationship (mode < median < mean) is established. The kurtosis value of this variable is 3.49 and it shows that kurtosis of distribution of this variable is longer than normal standard distribution. In Eviews software, kurtosis coefficient is smaller than 3 and it shows short kurtosis of data from the length of normal distribution. Briefly, the higher the kurtosis and length of a variable, the higher the density of data and conversely, the wider the distribution, the wider the ranges and dispersion among elements is high.

Table 2- Descriptive indices of study variables

Kurtosis	Skewness	Max	Min	SD	Mean	N	Sign	Variable
3.49	1.33	1.068	0.0419	0.091	0.2819	1034	r	Capital cost
5.98	11.59	0.470	-0.137	8.23	1.643	1034	FCF	Free cash flow
7.71	8.42	10.53	0.03	0.55	0.69	1034	L/TA	Investment opportunities
9.74	7.75	199.37	0.00	15.61	3.71	1034	SE/DE	Capital-based
3.83	1.08	0.98	0.00	0.17	0.24	1034	A/TA	Extra liquidity
3.53	2.77	0.23	0.00	0.02	0.02	1034	S/∑S	Competitive power of companies

8-The results of hypotheses of study

The independent variable coefficient of free cash flows in this model is -0.062 and it indicates that in case of the increase of 100 units in this variable, dependent variable is reduced as 6 units. Based on significance level of this variable, we can say this relation is significant at confidence interval 95%. It means that there is a negative and significant relation between free cash flows and capital cost of common stock. As shown in the Table, 71% of changes of dependent variable are explained by

right side variables. Although 29% of changes of dependent variable are not explained by right side variables, based on F Fisher statistics and its significance level, this model can fit the relationship between independent and dependent variables. Durbin-Watson statistics is one of the famous tests to determine auto-correlation. If the Durbin-Watson statistics is ranging 1.5 to 2.5, there is no auto-correlation. Based on value 1.806 for this statistics, we observe non-auto correlation. F Limer statistics is computed to evaluate the arrangement of data and panel or pooled data. In order to show whether panel data are efficient in estimation or not, F Limer test is used and two show which method (fixed effects or random effects) is suitable for estimation, Hausman test is used. Based on results of test (Table 2), F Limer statistics is higher than 0.05, thus the data should be poled. In linear regression models, one of the model parameters estimation method is least squares. One of the problems challenging this method is co-linearity. If the calculated co-linearity is ranging 1 to 10, based on value 2 for this statistics, there is no co-linearity problem.

Table 3- The analysis of independent variable coefficient in evaluation of first hypothesis (high investment opportunity)

$r = \alpha_0 + \alpha_1 FCFHO_{it} + \alpha_2 L/TA_{it} + \alpha_3 SE/DE_{it} + \alpha_4 A/TA_{it} + \alpha_5 S/\sum S_{it} + \epsilon_{it}$				
Significance level	T statistics	Coefficient	Explanatory variables	
0.0000	3.1528	1.749	Intercept	
0.0044	-3.3655	-0.062	Free cash flows (high investment opportunity)	
0.0000	-4.0146	-0.022	Investment opportunities	
0.0394	2.3728	0.042	Capital-based	
0.0295	-2.1839	-0.072	Extra liquidity	
0.0091	-3.2101	-0.053	Competitive power of companies	
	9.622		F Fisher statistics	
	0.0000		Significance level	
	0.71		Adjusted coefficient of determination	
	1.806		Durbin-Watson statistics	
	0.094		Significance level of F Limers	
	1		VIF	
$r = 1/749 - 0/062 FCFHO_{it} - 0/022 L/TA_{it} + 0/042 SE/DE_{it} - 0/072 A/TA_{it} - 0/053 S/\sum S_{it}$				

Table 4- The analysis of independent variable coefficient in first hypothesis (low investment opportunity)

$r = \beta_0 + \beta_1 FCFLO_{it} + \beta_2 L/TA_{it} + \beta_3 SE/DE_{it} + \beta_4 A/TA_{it} + \beta_5 S/\sum S_{it} + \epsilon_{it}$				
Significance level	T statistics	Coefficient	Explanatory variables	
0.0000	3.6188	0.395	Intercept	
0.0629	-0.0115	-0.019	Free cash flows (Low investment opportunity)	
0.0000	-4.3751	-0.026	Investment opportunities	
0.0043	3.6922	0.037	Capital-based	
0.0533	-0.7795	-0.006	Extra liquidity	
0.0000	-3.0662	-0.045	Competitive power of companies	
	6.138		F Fisher statistics	
	0.0000		Significance level	
	0.46		Adjusted coefficient of determination	
	1.937		Durbin-Watson statistics	
	0.067		Significance level of F Limers	
	2		VIF	
$r = 0/359 - 0/019 FCFLO_{it} - 0/026 L/TA_{it} + 0/037 SE/DE_{it} - 0/006 A/TA_{it} - 0/045 S/\sum S_{it}$				

The independent variable coefficient of free cash flows in this model is -0.019 and it indicates that in case of the increase of 100 units in this variable, dependent variable is reduced as 1 units. Based on significance level of this variable, we can say this relation is not significant. It means that there is no significant relation between these two variables. It means that there is no significant relation between free cash flows and capital cost of common stock in the companies with low investment opportunities. By comparison of independent variable coefficient in this model and previous model, we can say that despite positive relation between free cash flows with capital cost of common stock in both states of high and low investment opportunities, this relation has lost its significance in the companies with low investment opportunities.

Independent variable coefficient of free cash flows in this model is -0.074 and it shows that in case of increase of 100 units, dependent variable is reduced as 7 units. Based on significance level of this variable, the relationship between these two variables is significant.

The independent variable coefficient of free cash flows in this model is 0.023 and it indicates that in case of 100 units in this variable, dependent variable is increased as 2 units. Based on significance level of this variable, the relationship between these two variables is significant.

Table 5- The analysis of independent variable coefficient in second hypothesis (big)

$r = \delta_0 + \delta_1 FCFHS_{it} + \delta_2 L/TA_{it} + \delta_3 SE/DE_{it} + \delta_4 A/TA_{it} + \delta_5 S/\Sigma S_{it} + \epsilon_{it}$			
Significance level	T statistics	Coefficient	Explanatory variables
0.0000	3.0379	0.419	Intercept
0.0000	-4.2655	-0.074	Free cash flows (Big size)
0.0000	-3.0119	-0.034	Investment opportunities
0.0128	3.0827	0.029	Capital-based
0.0409	-2.4311	-0.016	Extra liquidity
0.0000	-3.1492	-0.051	Competitive power of companies
	8.252		F Fisher statistics
	0.0000		Significance level
	0.68		Adjusted coefficient of determination
	2.139		Durbin-Watson statistics
	0.082		Significance level of F Limers
	1		VIF
$r = 0/419 - 0/074 FCFHS_{it} - 0/034 L/TA_{it} + 0/029 SE/DE_{it} - 0/016 A/TA_{it} - 0/051 S/\Sigma S_{it}$			

Table 6- The analysis of independent variable coefficient in second hypothesis (small size)

$r = \lambda_0 + \lambda_1 FCFLS_{it} + \lambda_2 L/TA_{it} + \lambda_3 SE/DE_{it} + \lambda_4 A/TA_{it} + \lambda_5 S/\Sigma S_{it} + \epsilon_{it}$			
Significance level	T statistics	Coefficient	Explanatory variables
0.0000	3.8819	0.341	Intercept
0.0000	5.3222	0.023	Free cash flows (Small size)
0.1192	-0.0551	-0.028	Investment opportunities
0.0000	-4.2591	-0.034	Capital-based
0.0438	-2.0779	-0.021	Extra liquidity
0.0062	-3.0915	-0.037	Competitive power of companies
	7.602		F Fisher statistics
	0.0000		Significance level
	0.54		Adjusted coefficient of determination
	1.637		Durbin-Watson statistics
	0.079		Significance level of F Limers
	3		VIF
$r = 0/341 + 0/023 FCFLS_{it} - 0/028 L/TA_{it} - 0/034 SE/DE_{it} - 0/021 A/TA_{it} - 0/037 S/\Sigma S_{it}$			

9- DISCUSSION AND CONCLUSION

The results of hypotheses test showed that the relationship between free cash flows and capital cost in interaction with high investment opportunities was negative. Under high investment opportunities, the company applied free cash flows for optimal use of resources and via profit increase and earnings long-term growth reduced investment risk in stock and investor mostly invested or held capital. Thus, by reduction of risk, the investor even with lower expected return (low capital cost) invested on company. However, in low investment opportunities, free cash flows had not significant effect on capital cost of common stock. In big companies, the company reduced the cost of capital by credits and absorbing capital. In small companies, extra free cash flows showed the lack of allocation of resources and increased the capital cost of common stock. In addition, it was shown that investment opportunities created extra liquidity and competitive power of companies reduced capital cost and production user-based nature except in small companies increased capital cost. There were some limitations in the study. The study sample was selected among the companies listed on TSE and the companies were not active economic units in terms of price, ownership structure and type of products, thus generalization of findings should be done carefully. During the data collection, due to the lack of availability of data of company, we excluded them of final sample or final matrix and in case of availability of the data, generalized results were achieved. The above limitations were not controlled. Based on the good results of auto-correlation tests between the observations by Durbin-Watson statistics and significance of correlation coefficients, we can be sure of the lack of effect of these factors on the relations between the variables of study.

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