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The Effect of Systematic Risk on Cost of Capital determinants Applying CAPM Model: Evidence from Tehran Stock Exchange (TSE)

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Abstract: A firm's cost of capital should be determined by its exposures in respect of systematic risk, indicated by beta means how changes in systematic risk affect firm cost of capital and its determinants like cost of equity, cost of debt ,debt and equity financing mix. The most difficult component of the weighted average cost of capital to calculate is the cost of equity. One approach to estimate the cost of equity is the Capital Asset Pricing Model approach where the financial manager estimates the firm's beta. A time series regression was used to estimate the beta. After dividing the firms' systematic risk into three groups with low, middle and high beta, our findings provide that the beta factor has strong impact on the relationship between weighted average cost of capital and its determinants which indicates firms with high beta have significantly higher cost of equity, higher cost of debt, higher equity financing and lower debt financing and lower effective tax rate benefits and finally higher cost of capital. Also there is indirectly and insignificantly relationship between systematic risk and debt financial leverage which indicates debt financing and also financial leverage decreases insignificantly by increasing the beta and finally the cost of capital increases insignificantly. So Firms can benefit from improved systematic risk management through a reduction in their cost of equity capital, a shift from equity to debt financing, and higher effective tax benefits associated with the ability to add debt. The cost of capital that range from -17 to 100 basis points are followed by significant changes in the cost of equity that range from -20 to 130 basis points and significant changes in the cost of debt that range from 0 to 220 basis points.

Key worsd:

INTRODUCTION

Finance perspectives have stated that the three primary decisions in financial management are investment decision, cash flows decision and capital structure decision. Among those three decisions, capital structure was adheres as one of strategy that can be used to deal with systematic risk. Capital structure is one of the most important strategic decisions that face financial managers. One popular technique of capital structure is an accurately estimated weighted-average-cost-of-capital (WACC) that is used to discount the future cash flows. To estimate the WACC, the financial manager must calculate the after-tax cost of debt, the cost of preferred stock, and the cost of equity. The most difficult component to calculate is the cost of equity. One method to calculate the cost of equity is the Capital Asset Pricing Model (CAPM), which is examined in this paper.

The fundamental premise of the CAPM is that the risk of a stock can be decomposed into two components. The first component is systematic risk, which is related to the overall market. The second component is non-systematic risk, which is specific to the individual stock. The CAPM approach further asserts that the expected return for a security is related only to the security's beta, which is the measure of systematic risk. Unfortunately, financial managers cannot directly observe beta, but must estimate it. To estimate the beta of a firm, a time-series regression is often used and requires the financial manager to select both a return interval and an estimation period.

Does cost of capital determinants affect the cost of capital related to systematic risk? Most theoretical and empirical cases in the finance and accounting literature predict that decreasing systematic risk reduces cost of equity based on CAPM model and thus leads to lower costs of capital. Since the existing empirical literature has largely focused on relationship between cost of capital determinants and cost of capital by P. Sharfman *et al* (2008) and others, negative relationship between beta and expected return of equity by Armstrong *et al* (2009) , some positive relationship between level of leverage and beta by M. Bhatti *et al* (2010) and others. Armstrong *et al* (2009) demonstrated that negative beta behave differently from positive beta. H. Prasetyo (2011) categorized

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the level of systematic risk in three groups; lower, middle and higher systematic risk ,which was all positive beta ranging from 0 to up ,to test relationship between financial leverage and capital intensity among those three categories and found that the tree groups of beta has different R- Pearson product moment and different significant levels. Another study were done in iran by Jamshidinavid *et al* (2012) and showed no significant relation between efficiency indicators as independent variables, in one hand, and systematic risk (Beta) as dependant variables and suggested according to the importance of systematic risk estimation to investigate the relation of other financial and accounting indicators and variables and the kind of systematic risk. In their study there was no focus on the beta level may be rang from negative beta to positive one. Previous studies give some insight into the choice of this study in order to test the effect of systematic risk on cost of capital determinants, Although most current empirical researches has its own area regarding the beta ,level of leverage and cost of capital determinants and has recognized this problem in each area separately and has attempted to address it. The premise of this paper is that if cost of capital determinants affects the cost of capital for a firm, it must be through systematic risk as mentioned by Armstrong *et al* (2009) and H. Prasetyo (2011) and others in Iranian capital market. Therefore, the effect of cost of capital determinants must depend on the risk-factor loading, or beta, of the firm. This paper examines do the firms with different level of systematic risk exposures, ranging from negative beta to positive one ,behave differently to make an optimal trade-off financing and cost of capital reduction

This body of research concludes that the beta factor has strong impact on the relationship between weighted average cost of capital and its determinants which indicates firms with lower beta have significantly lower cost of equity, lower cost of debt, lower equity financing and higher debt financing and higher effective tax rate benefits and finally lower cost of capital. So Firms can benefit from improved systematic risk management through a reduction in their cost of equity capital, a shift from equity to debt financing, and higher effective tax benefits associated with the ability to add debt.

The remainder of the paper consists of five sections. The first section focuses on the breakdown of the measures into their contributing components and the expression some previous studies. The second section describes the research method. The third section contains the descriptive statistics of the measures and the final section contains the summary and the conclusions.

2. Literature Review:

Firms raise money from both equity investors and lenders to fund investments. If we consider all of the financing that the firm takes on, the composite cost of financing will be a weighted average of the costs of equity and debt, and this weighted cost is the cost of capital. Hirschey *et al* (2008) demonstrated how to estimate hurdle rates of the firm.

Estimating hurdle rates of the firm.

According to Hirschey *et al* (2008) we must estimate the costs of equity, debt, and capital for firm. The cost of equity is the rate of return investors require on an equity investment in a firm. The risk and return models need a riskless rate and a risk premium (in the CAPM model) or premium (in the APT and multifactor models).They also need to measure of a firm's exposure to market risk in the form of beta. These inputs are used to arrive at an expected return on an equity investment.

$$expected\ return = riskless\ rate + beta\ (\ risk\ premium) \tag{1}$$

We must estimate the inputs to this model-riskless rate, the risk premium, and the beta of equity. We defined a riskless rate as one for which the investor knows the expected returns with certainty. The riskless rate is the rate on a zero-coupon government bond that matches the time horizon of the cash flow being analyzed. The risk premium measures the extra return that would be demanded by investors for shifting their money from riskless investment to an average risk investment. There are two ways to estimate the risk premium in the capital asset pricing model .one is to estimate historical premium which is the difference between average return on stocks and average returns on riskless securities over an extended period of history. In calculating the average returns over past periods, since the CAPM is built on the premise of expected returns being averages and risk being measured with variance and the variance is estimated around the arithmetic average and not the geometric average, it may be seem logical to stay with arithmetic averages to estimate risk premium. The next is to estimate implied premium which is the required return on equity minus the riskless rate.

$$implied\ equity\ risk\ premium = the\ required\ return\ on\ equity - the\ riskless\ rate \tag{2}$$

We can estimate the required return on equity from the following growth rate:

$$required\ return\ on\ equity = r_e = \frac{D_1}{P_0} + g \tag{3}$$

The third set of inputs that we need to put in risk and returns models are the betas for investment. In the CAPM, the beta of an investment is the risk that the investment adds to a market portfolio. Three approaches are available for estimating these parameters. First is to estimate historical market betas which counted the conventional approach to estimating the beta of an investment is a regression of returns on the investment against returns on a market index (in practice we tend to use a stock index such as S&P 500, as a proxy for the market portfolio).The standard procedure for estimating betas is to regress stock returns (R_j) against market returns (R_m):

$$R_j = a + bR_m \quad (4)$$

Where

$a = intercept\ from\ the\ regression$,

$$b = slope\ of\ the\ regression = \frac{covariance\ (R_j\ , R_m)}{\sigma_m^2}$$

The slope of the regression corresponds to the beta of the stock and measures the riskiness of the stock. The intercept of the regression provides a simple measure of performance of the investment during the period of the regression, when returns are measured against the expected returns from the capital asset pricing model. It can be compared this regression formula with following rearrangement of the CAPM model:

$$R_j = R_f + \beta\left(R_m - R_f\right) = R_f(1-\beta) + \beta R_m \quad (5)$$

Thus, a comparison of the intercept a to $R_f(1-\beta)$ should provide a measure of the stock's performance. Second is to estimate Fundamental betas which is determined with regard to the type of business, the degree of operating leverage and financial leverage of a firm may be estimated from a regression .(a) The type of business: the more sensitive a business is to market conditions, the higher is beta. Thus, cyclical firms (housing companies) have higher betas than noncyclical firms (food processing companies). (b) The degree of operating leverage: the degree of operating leverage is a function of firms cost structure and indicates the relationship between fixed costs and total costs. A firm that has high fixed costs relative to total costs has high operating leverage and higher beta. The operating leverage of a firm is average changes in operating income as a function of average changes in sales over the period of time:

$$degree\ of\ operating\ leverage = \frac{\%change\ in\ operating\ profit(EBIT)}{\%change\ in\ sales} \quad (6)$$

(c) The degree of financial leverage of the firm*:* An increase in financial leverage$\frac{D}{E}$ will increase the beta of the equity in a firm. The operating leverage of a firm is average changes in net income as a function of average changes in sales over the period of time. Higher leverage increases the variance in net income and higher beta makes equity investment in the firm riskier. If all the firms risk is produced by the stock holders (the beta of debt is zero) and debt has a tax benefit to the firm, then

$$\beta_l = \beta_u\left(1 + \frac{D}{E}(1-t)\right) \quad (7)$$

$\beta_l = levered\ beta\ for\ equity$,

$\beta_u = unlevered\ beta\ (the\ beta\ of\ the\ firm\ without\ any\ debt)$

$$\frac{D}{E} = \frac{debt}{equity}$$

$t = corporate\ tax\ rate$

The last one is to estimate Accounting betas which is determined in respect of the market risk parameters from accounting earnings rather than from traded price. Regressing the changes in earnings (net income) against changes in profits for the market index yields it can be calculated the beta.

The cost of debt measures the current cost to the firm of borrowing funds to finance project. As the interest rates increase, the cost of debt and the default risk of the company will also increase. But since interest is tax deductible, the after tax cost of debt is a function of the tax rate and makes it lower than the pre-tax cost of debt.

$$post - tax\ cost\ of\ debt = pre - tax\ cost\ of\ debt(1-t) \quad (8)$$

The weights, assigned to equity and debt in calculating the weighted average cost of capital, have to be based on market value, not book value. The market value of equity is the number of shares outstanding times the current stock price and a simple way to convert book value debt into market value debt is to treat the entire debt on the book values.

Since a firm can raise its money from three sources – equity, debt, and preferred stock – the cost of capital is defined as the weighted average of each of these costs. The weights on each of these components should reflect their market value proportion. Thus E,D and PS are the market value of equity, debt, and preferred stock, respectively and k_e,k_d and k_{ps} are the cost of equity, the cost of debt and the cost of preferred stock ,respectively, the cost of capital can be estimated as follows:

$$Cost\ of\ capital = k_e\left(\frac{E}{E+D+PS}\right) + k_d\left(\frac{D}{E+D+PS}\right) + k_{ps}\left(\frac{PS}{E+D+PS}\right) \quad (9)$$

R. Daves *et al* (2000) demonstrated that financial managers can estimate the cost of equity via the CAPM approach and if the financial manager estimates the firm's beta via regression analysis, then the financial manager must select both the return interval and the estimation period. Regarding return interval, this study finds that the financial manager should always select daily returns because daily returns result in the smallest standard error of beta or greatest precision of the beta estimate. However, regarding estimation period, the financial manager faces a dilemma. While a longer estimation period results in a tighter standard error for the estimate of beta, a longer estimation period also results in a higher likelihood that there will be a significant change in the beta. Thus, the beta estimated over longer estimation periods is more likely to be biased and of little use to the financial manager. The results show that an estimation period of three years captures most of the maximum reduction in the standard error of the estimated beta from a one-year estimation period to an eight-year estimation period. Additionally, less than fifty percent of the firms experience a significant shift in beta over a three-year period.

P. Sharfman *et al* (2008) showed that improved environmental risk management is associated with a lower cost of capital by study of 267 U.S. firms. Their findings provide an alternative perspective on the environmental economic performance relationship, which has been dominated by the view that improvements in economic performance stem from better resource utilization. Firms also benefit from improved environmental risk management through a reduction in their cost of equity capital, a shift from equity to debt financing, and higher tax benefits associated with the ability to add debt. These findings help build better theory regarding the outcomes of strategic improvements in environmental risk management.

Armstrong *et al* (2009) showed a "beta" effect which decreases expected returns of equity when beta is positive, but increases expected returns when beta is negative.

D. Mnzava (2009) using both time series and cross sectional models involving fundamental determinants of systematic risk, provided an empirical evidence that corporation tax is one of the significant determinants of systematic risk and that systematic risk is positively related to leverage, effective corporate tax rate, return on assets, financial risk, growth in earnings and the risk of real asset., This study concludes that corporation tax changes of 1984 in the UK led to a significant decrease in firms' equity betas.

Junaid Iqbal *et al* (2010) explored the relationship among financial variables and systematic risk. Eight financial variables are explored as determinants of systematic risk. Results of 93 non-financial firms listed in Karachi Stock Exchange from 2005-2009 showed that liquidity, leverage, operating efficiency, dividend payout and market value of equity are inversely associated while profitability, firm size and growth are positively related with systematic risk (beta). The significant association of liquidity, operating efficiency, profitability, firm size, dividend payment and market value of equity are similar with earlier studies. Findings are fruitful for investors and financial policy makers to maximize the returns.

M. Bhatti *et al* (2010) investigated affect of leverage on stock returns and systematic risk in the corporate sector of Pakistan and determined the relation between leverage and systematic risk by the data collected from eight industries that are Cotton, Engineering, Chemicals, Sugar & Allied, Cement, Fuel & Energy & transport & Communications. They find out that high level of leverage creating a high level of systematic risk, leading to high volatility in the stock prices.

H. Prasetyo (2011) found through the decomposition that based on mathematical perspectives, there should be inverse relationships between financial leverage and capital intensity proxy by unleveraged risk which depends as risk the firm should face if there is no debt for sourcing of funds .It shows how manager used capital structure proxy by financial leverage to deal with the turbulent in systematic risk. Using samples of 225 public companies in Indonesia from the year of 2000 to year of 2009, the paper try to answer the puzzle. In order to have better understanding concerning the relationships, they categorize the level of systematic risk in three groups; lower, middle and higher systematic risk. Deeper analysis in this study indicates strong support to the hypothesis that in the long run, there is a negative relationship between financial leverage and capital intensity among those three categories.

M. Al-Qaisi (2011) found that several factors including size, financial leverage, and government deficit and inflation rate significantly affect a company's systematic risk value in Amman Stock Exchange.

Jamshidinavid *et al* (2012) investigated if there is any positive relation between efficiency indicators (work efficiency and capital indicators) as independent variables, in one hand, and systematic risk (Beta) as dependant variables, in another hand by sample including 102 members, from statistical society of the companies accepted in Tehran stock market, using screening method (systematic elimination) during six years from 2005 to 2010. They analyzed using the Pearson correlation and the research hypothesis analyze. The results showed no significant relation between the considered variables. They suggested according to the importance of systematic risk estimation to investigate the relation of other financial and accounting indicators and variables (like: functional and financial levers, function indicators …) and the kind of systematic risk.

3. Research Method:

3.1. Hypothesis:

To investigate the relationship between the dependent and independent variables, the following null hypothesis is formulated:

There is significant relationship between financial leverage and systematic risk based on the capital assets pricing model.

There is significant relationship between financial leverage and cost of capital in each β group of systematic risk based on the capital assets pricing model.

There is significant relationship between systematic risk and cost of capital in each β group based on the capital assets pricing model.

There is significant relationship between cost of capital and its determinants in each β group of systematic risk based on based on the capital assets pricing model.

3.2 Data:

The measures systematic risk (β) and weighted cost of capital (K_W) as well as their contributing components cost of equity (K_E), cost of debt (K_D) , debt ($\frac{D}{D+E}$) and equity ($\frac{E}{D+E}$) percentage , are calculated for sample firms listed in the Tehran Stock Exchange that have been active in the TSE during the 7-year period from 2003 to 2010. Firms are examined in this study that their financial statements ends on 18-mar, have been listed during the period from 2003 to 2010, posses all necessary data to calculate research variables, they must be manufacturing firm and their nature of activity not to be financial and investment and have computable beta coefficients. So the 50 active firms in second quarter of 2010 year are considered as the initial sample. The only 22 firms have the qualification among these 50 firms. In order to collecting the required data of this survey, the fundamental financial statements, information contained in the Site of Tehran Stock Exchange and Research Management & Development of Islamic Studies were used. Variables were Calculated using excel spreadsheet and analyzed using spss.17 statistical software.

3.3 Statistical Techniques:

In order to evaluate impact of the measures, the relationships between the measures and market value of firms are investigated. For this purpose, regression analyses with the market value of firm as dependent variable and the various measures as the independent variables are conducted. Equation below shows the firm valuation model:

$$Y_{i,t} = \beta_0 + \beta_1 X_{1\,i,t} + \beta_2 X_{2\,i,t} + \ldots + \beta_k X_{k\,i,t} + \varepsilon_{i,t} \quad (10)$$

Y: dependent variable, i: the number of company, t: time period, k: independent variable. Research hypothesis are examined using the above model

3.4 Measures:

3.4.1 Dependent Variable:

The hypothesis applied in this study focus on the relationship between the independent variables and cost of capital estimated by weighted average cost of capital (WACC). In order to estimate cost of capital

$$Cost\ of\ capital = k_e \left(\frac{E}{E+D+PS}\right) + k_d \left(\frac{D}{E+D+PS}\right) \quad (11)$$

3.4.2 Independent Variables:

The primary objective of this study is to investigate the relationship between cost of capital components and systematic risk as independent variables .The exposures included in regression model. The measures are calculated based on information obtained from the standardized financial statement data contained in the stock exchange database.

If we consider all of the financing that the firm takes on, the composite cost of financing will be a weighted average of the costs of equity and debt, and this weighted cost is the cost of capital. To estimate hurdle rates of the firm we must estimate the costs of equity, debt, and capital for firm. The cost of equity is the rate of return investors require on an equity investment in a firm. The risk and return models need a riskless rate and a risk premium (in the CAPM model) or premium (in the APT and multifactor models).They also need measures of a firm's exposure to market risk in the form of beta. These inputs are used to arrive at an expected return on an equity investment.

$$K_e = R_f + \beta\,(R_m - R_f) \quad (12)$$

This expected return to equity investors is compensation for the market risk in the investment and it is the cost of equity. We must estimate the inputs to this model-riskless rate, the risk premium, and the beta of equity. The rate on government participation bonds is used to estimate the riskless rate and The Index of Tehran Stock Exchange is used to estimate the market rate of return for 12 months and then the average of monthly market rate of return for each 7-year calculated by the following equation as shown in table1:

$$R_m = \frac{I_t - I_{t-1}}{I_t - I_{t-1}} \quad (13)$$

Table 1: The Riskless Rate And The Market Rate Of Return In

year	2003	2004	2005	2006	2007	2008	2009
R_f	15.5	15.5	15.5	18	16	16	17
R_m	-1.61	-2.15	-0.02	0.16	-1.56	3.75	5.11

Source: Based on researcher computation

The third set of inputs that we need to put in risk and returns models are the betas for investment. In the CAPM, the beta of an investment is the risk that the investment adds to a market portfolio. Monthly prices stipulated in the online Microsoft Office Access Database of Companies listed in Tehran Stock Exchange were used to estimate the annual beta coefficient of each company. The list of 154 year-company data and estimated beta are shown in the table2 calculated as the following:

$$\beta = \frac{cov(R_i, R_m)}{\sigma_m} \quad (14)$$

Table 2: Estimated Beta Exposure Of 154 Year-Company Data In Tse

Row	Trademark	2003	2004	2005	2006	2007	2008	2009
1	DALBOR	-2.26	-0.23	1.23	0.72	0.17	0.95	0.43
2	KHAVAR	1.20	1.18	-0.74	1.06	0.19	0.90	1.28
3	KHEPARS	3.16	0.91	-0.19	1.28	-0.05	-0.34	1.48
4	SHEPTRO	1.26	0.67	1.13	0.25	1.11	-0.38	1.32
5	TAYRA	3.18	1.47	-0.67	1.25	1.63	0.75	-0.10
6	KEROY	0.45	2.27	4.71	1.65	2.37	2.06	0.75
7	TEPKO	0.20	0.58	0.88	0.75	-0.48	0.60	1.92
8	PETAYER	0.12	-1.37	7.09	0.08	0.63	0.24	-0.83
9	DASVE	0.40	0.69	7.26	1.90	0.39	0.19	-0.12
10	DEJABER	0.92	0.85	0.46	0.23	0.06	1.01	0.12
11	DEKOSAR	3.65	0.92	1.70	-0.27	0.74	0.85	0.59
12	KETABAS	0.21	-0.22	2.77	1.28	0.70	0.76	1.51
13	VELSAPA	0.10	0.10	-0.32	1.16	0.59	2.27	1.09
14	KEGOL	0.95	0.15	-0.34	3.17	1.58	1.33	1.46
15	FABAHONAR	1.41	1.55	5.36	0.90.	0.69	1.15	1.73
16	SHEKARBON	-0.29	1.67	-1.00	-0.05	0.15	1.43	1.22
17	KHEBAHMAN	2.30	1.20	2.06	1.61	0.97	0.83	0.45
18	DESOBHA	1.08	1.28	0.12	0.08	-0.08	0.14	-0.04
19	KHETOGA	1.77	0.63	-0.82	-0.31	0.88	1.14	1.47
20	VELIZ	3.94	2.42	-1.29	0.50	0.26	0.39	0.23
21	KECHAD	1.54	1.97	-0.32	2.26	1.07	1.92	2.72
22	BENIROO	0.45	-2.15	1.76	0.30	-0.45	-0.32	0.90

Source: Based on researcher computation

4. Descriptive Statistics of the Measures:

As previously stated, this research analyzes all 55 active Iranian listed companies within period of 2003 to 2009 which possessed all the necessary information for analysis. In order to make the study meaningful, it is necessary that firms have to be categorized according their systematic risk. The result was a final sample of 22 firms with 154 year-data. After calculating systematic risk for each firms, these 154 year-data firms were then subdivided into three groups; lower, middle and higher systematic risk. The result of this categorization can be seen in table 3.

Table 3: Grouping of systematic risk

β Group	Risk Category	Group size	frequency	Cumulative frequency
down – 0.50	Low	60	39	39
0.51 – 1.00	Middle	30	19	58
1.01 -up	High	64	42	100
total	-	154	100	-

Beta ranges between -2.26 to 7.26

Based on table 3, this research indicates that 58% of samples have systematic risk less than 1 means that most of the samples were dealing with low and middle systematic risk along 2003 to 2009 and 42% of samples have systematic risk more than 1 means that less of the samples were dealing with higher systematic risk along 2003 to 2009. An overview of key exposures for the sample firms in each β group is summarized in Table .we find an increasing trend in β, K_E, K_W, which means higher beta and higher cost of equity result in higher cost of capital and decreasing trend in *t*, which mean lower tax rate result in lower tax shield advantages and then higher cost of capital for sample firm. Another integral conclusion is about financing mix policy for different

level of betas indicates firms with low systematic risk have lesser equity and more debt than the firms with high systematic risk.

Table 4: Descriptive statistics of exposures

β Group		β	K_E	W_E	K_D	W_D	K_W	t
down – 0.50	No	60	60	60	60	60	60	60
	Mean	-.1403	13.9250	.5564	12.4565	.4436	11.4172	.1403
	Median	.0700	17.1550	.6100	9.7200	.3900	12.0550	.1450
	SD	.57375	9.78954	.27385	27.02963	.27385	7.09500	.15236
0.51 – 1.00	No	30	30	30	30	30	30	30
	Mean	.7817	28.3790	.6017	15.3513	.3983	21.7957	.0840
	Median	.7550	27.7500	.6100	12.5550	.3900	21.8500	.0750
	SD	.12567	2.77956	.23839	18.84933	.23839	4.86061	.08377
1.01 -up	No	64	64	64	64	64	64	64
	Mean	2.0072	47.7495	.5970	12.3784	.4030	32.5888	.0759
	Median	1.5650	41.0550	.6700	11.3900	.3300	30.6400	.0350
	SD	1.28080	20.61492	.26241	12.64294	.26241	15.64899	.09402

This table provides information on the financials of the sample firms. Data was retrieved from spss.17.We report figures consistent with the sample period from 1995 to 2008. *No* refers to the number of firms for which data was available in the respective years. *Mean* and *median* numbers are reported.*SD* refers to the standard deviation of the respective figure in the sample. A definition of the variables reported is included in the appendix.

Table 5: Correlation Between Financial Leverage And Systematic Risk

		Low β	Middle β	High β
FL	Pearson Correlation	-0.145	-0.237	-.243
	Sig. (2-tailed)	0.269	0.208	.870
	N	60	30	64

A review of the result in table 5 indicates strong support for rejecting the first hypothesis which indicates there is a relationship between systematic risk and financial leverage based on CAPM model. A closer review of the results in these tables indicates an insignificant negative relationship between systematic risk and financial leverage based on CAPM model for all three beta groups.

The strongest insignificant negative effect mostly can be seen in higher systematic risk and as you see the more the beta, the more the Pearson product to some extent.

Table 6: Correlation

β Group			β	FL	K_D	K_E	D %	E%	t
down – 0.50	K_w	Pearson Correlation	.644**	-.349**	.350**	.648**	-.370**	.370**	-0.248
		Sig. (2-tailed)	.000	.006	.006	.000	.004	.004	0.056
		N	60	60	60	60	59	59	60
0.51 – 1.00	K_w	Pearson Correlation	.691*	-.608**	.369**	.706**	-.471**	.471**	-0.250
		Sig. (2-tailed)	.033	.000	.004	.009	.000	.000	0.867
		N	30	30	30	30	30	30	30
1.01 -up	K_w	Pearson Correlation	.722**	-.871**	.416**	.735**	-.608**	.608**	-.261*
		Sig. (2-tailed)	.000	.000	.001	.000	.000	.000	.037
		N	64	64	64	64	64	64	64

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

A review of the result in table 6 indicates strong support for the second hypothesis which indicates there is a relationship between financial leverage and weighted average cost of capital of firm based on CAPM model. A closer review of the results in these tables indicates a strong negative relationship between financial leverage and weighted average cost of capital of firm based on CAPM model for all three systematic groups.

The strongest negative effect mostly can be seen in higher systematic risk and as you see the more the beta, the more the Pearson product.

We found strong support for the third hypothesis which indicates there is a relationship between beta and weighted average cost of capital of firm based on CAPM model. A closer review of the results in these tables indicates a strong positive relationship between beta and weighted average cost of capital of firm based on CAPM model for all three systematic groups.

The strongest positive effect mostly can be seen in higher systematic risk and as you see the more the beta, the more the Pearson product.

We found strong support for the fourth hypothesis which indicates there is a relationship between weighted average cost of capital of firm and its determinants based on CAPM model. A closer review of the results in

these tables indicates a strong positive relationship between weighted average cost of capital of firm and cost of equity, cost of debt and equity financing based on CAPM model for all three systematic groups and a strong negative relationship between debt financing and weighted average cost of capital of firm based on CAPM model.

The strongest positive and negative effect mostly can be seen in higher systematic risk and as you see the more the beta, the more the Pearson product.Also we test the forth hypothesis by multivariate regression and the result of the multivariate regression is summarized in table 7.

Table 7: The result of the multivariate regression of cost of capital determinants for different β group

β Group	Group size	R-Pearson Product Moment	R^2	Adjusted R^2	ANOVA	
					F	Sig.
down – 0.50	60	0.776	0.603	0.581	27.791	0.00
0.51 – 1.00	30	0.896	0.803	0.780	35.363	0.00
1.01 -up	64	0.968	0.937	0.934	295.938	0.00

A review of the result in table 7 indicates that among all active Iranian listed company, the strongest relationship between weighted average cost of capital of firm and its determinants based on CAPM model can be seen in the high β group.

5. Summary:

We estimated beta applying capital asset pricing model (CAPM) for per year during the consideration period from 2003 to 2009 for sample firms selected from active companies in Tehran Stock Exchange (TSE) .Then we categorized these estimated betas into three groups: low β, middle β and high β to realize the effect of systematic risk on relation between cost of capital and its determinant. We tested the four hypotheses and analyzed the relation between dependent and independent exposures applying correlation and multivariate regression.

The conclusion of first hypothesis testing indicates there is an insignificant negative relationship between systematic risk and financial leverage based on CAPM model for all three beta groups which means an increase in systematic risk will cause to an insignificant decrease in financial leverage. This finding is consistent with the findings of H. Prasetyo(2011), Junaid Iqbal (2010) and M. Al-Qaisi (2011) and contradicted with M. Bhatti(2010)related to the direction of the correlation.

The conclusion of second hypothesis testing indicates there is a relationship between financial leverage and weighted average cost of capital of firm based on CAPM model. A closer review of the results indicates a strong negative relationship between financial leverage and weighted average cost of capital of firm based on CAPM model for all three systematic groups which means an increase in financial leverage will cause to a significant decrease in financial leverage. This may be because of advantages of tax shield which correlation illustrated in table 6 Shows the lower the beta, the higher debt and finally insignificantly the lower the effective tax rate, on the other hand the higher the beta, the lower debt and finally significantly the more the effective tax rate that result in low tax shield which is consistent with finding of D. Mnzava (2009).

The result of third hypothesis testing indicates there is a relationship between beta and weighted average cost of capital of firm based on CAPM model. A closer review of the results indicates a strong positive relationship between beta and weighted average cost of capital of firm based on CAPM model for all three systematic groups which means an increase in beta will cause to a significant increase in firm's cost of capital which is consistent with P. Sharfman (2008)findings.

The result of fourth hypothesis testing indicates there is a relationship between weighted average cost of capital of firm and its determinants based on CAPM model. A closer review of the results indicates a strong positive relationship between weighted average cost of capital of firm and cost of equity, cost of debt and equity financing based on CAPM model for all three systematic groups which means a increase in cost of debt and equity and equity financing would be cause an increase in cost of capital . Other closer review of the results indicates a strong negative relationship between debt financing and weighted average cost of capital of firm based on CAPM model which means a decrease in debt financing would be cause an increase in cost of capital. This finding is consistent with P. Sharfman (2008).

Also we found that the strongest effect mostly can be seen in higher systematic risk and as mentioned earlier the more the beta, the more the Pearson product. So it can be concluded that high beta leads to high cost of equity which is consistent with Armstrong (2009)and P. Sharfman (2008)findings.

We summarized our findings in figure1:

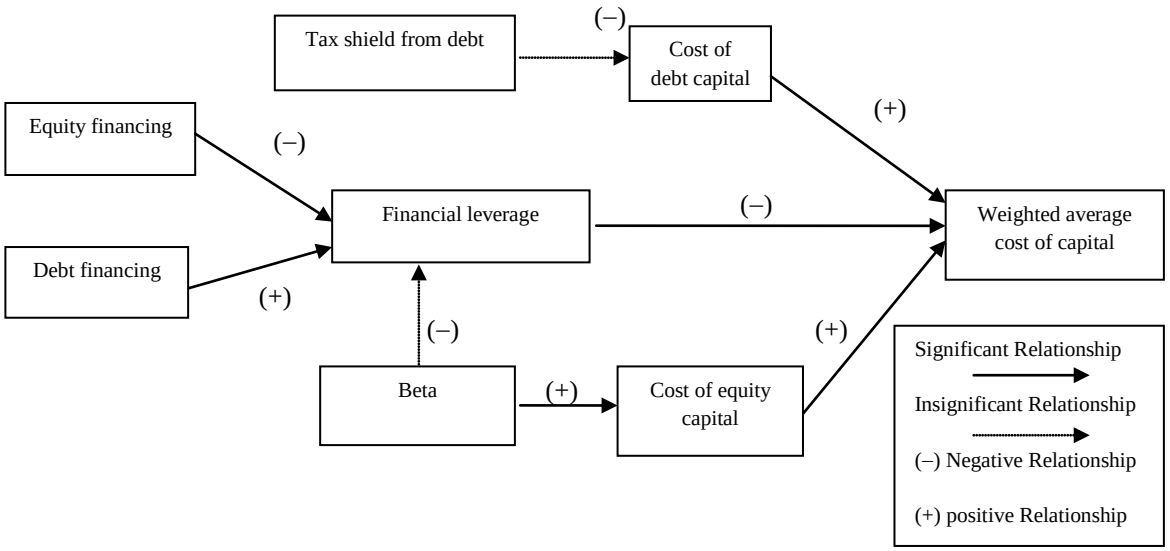

Fig. 1: Concepyual Model

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