

Estimating Expected Return based on Capital Asset Pricing Model compared with Stock Interest Rate at Tehran Stock Exchange

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Abstract

The objective of this study was to estimate the expected return rate based on asset pricing model compared with stock interest rate at Tehran Stock Exchange. Data related to 104 firms as sample was analyzed during 2010-2015 (n= 624). Data was analyzed using Excell and Eviews 6 software which central indices including mean, median and standard deviation dispersion indices, Skewness and Kurtosis were used in descriptive statistic part. These indices were conducted separately. Then, the normality of dependent variable was tested. Results suggested that

- P/E ratio significantly related to expected return rate of investors based on CAPM model
- P/E ratio significantly related to expected return rate of investors based on CAPM model in vehicle industry.
- P/E ratio significantly related to expected return rate of investors based on CAPM model in pharmaceutical, cement, lime, and Plaster.

Introduction

Using asset pricing model is one of the methods helping to investors to explore risk and return of investment. This model was introduced by William Sharp in 1960. In the Sharp model which is called asset pricing standard model, the systematic effect of base portfolio is measured. This model has been highly regarded by investors and financial analysts.

The main subject in financial areas is that why different assets has different returns. In this regard, pricing theories based on theoretical conceptions have tried to specify that why some assets has higher or lower return compared with others. Previously, the firms and financial institutions, investors and financial experts considered the higher return in compatible with higher risk. But, using only CAPM model, the economists could measure the risk rate and the reward which is obtained for its tolerance. In 1964, the economist named William Sharp succeed to propose the single-factor model of asset pricing. The model is very simple and comprehensible compared with normative and cancellation model of Markowitz.

Providing the methods and stock analysis tools is one of the most important subjects related to investment culture in the current status of the country economic and given to economic policies to change capital market through re-forming stock exchange market and attracting funds by directing private part saving and its active participation in economic activities. Investment can be defined as losing some funds now with the hoping of gaining expected interest in the future. But, there is no confidence to the future events always, and uncertainty to all events in future has no identical degree. The person who has a decision to invest in common stock need to determine its intrinsic value, and then compare it with the market price. Some methods such as cash flow of share, added value, discounted cash flow and price-income ratio etc. were applied to estimate the intrinsic value of share. Today's, many of financial analysts as the price-income ratio as value deterministic factor. In fact, they compare the stock price with price-income ratio of other firms in industry and overall changes of market using this method. Also, each of investors seek different expected return rate related to investment in common stock according to their risk taking and expectations. Using asset pricing model, we can measure shareholders' expected return (IzadiNya et.al. 2008:76-77).

Securities assessment is central core of investment decision-makings. It has been of interest to economic and financial experts. The financial market's analyzers use from two fundamental and technical analysis. Technical analysis was proposed by Charles Dow about 100 years ago. In technical analysis is assumed that every things were considered in price. The analyzer need to transactions volume and prices to technically analysis. In fundamental analysis, the whole economic is considered firstly and then the effective factors. Next, an industry is considered and in the next stage, a firm was selected among the firms of that industry, and then its stock value is determined based on financial instruments. If the obtained value for a firm is higher than market price, it will be considered valuable and is purchased. One of the assessment methods used by analyzers is price-to-

income coefficient of each share. In fact, although the dividend discounted models used more by investors and investment publications, the securities analyzers use of this method more than dividend discounted model. Although, it seems that use of price-to-income coefficient of each share is simpler than others, its simplicity should not cause that the investors ignore uncertainty future. So, the main problem of this study is that what is the rate of expected return based on asset pricing model compared with stock interest rate in Tehran Stock Exchange?

It should be noted that this study was faced with some limitations:

1. The study period is the prosperity period of the market, or in other words, it was the period of prices' bubble in stock exchange, and the price-to-income ratio value has a considerable growth in this period than previous years and perhaps it influence on the results of this study.
2. Applying asset pricing model is caused that only the systematic risk factors is considered and the unsystematic risk factors is ignored, therefore, if we consider the unsystematic risk factors, perhaps the results of this study will be different.

Review of Related Literature

Markowitz defined the conditional relation of risk and return and semi-variance. He concluded that the semi-variance consider the risk of the positive changes in price differently from negative changes risk. Developing CAPM model, Merton believed that if the stock price follow the normal log distribution, this model will be more efficient than traditional CAPM model. At last, he proposed the conditional model of CAPM. Levy, and then Fabozzi and Francis tested the beta constant in up and down markets formally. Hansen and Scott believed that the conditional model of CAPM is a generalized model of non-conditional CAPM model. It means that it is assumed that the investors has homogenous conditional expectations related to assets return. Fama and French indicated that beta has no ability to describe cross sectional the return, particularly in current markets. Pentgill, Sandrom and Madure tested a condition between beta and return. John Crombez, Rody Vander Venet studied the conditional relation between risk and return in Brussels stock exchange. Their objective was to answer to the question that: Is the given principles in advanced markets can be applied in small capital markets? About

conditional beta, Campbell believed that conditional beta was tested for the periods that average return of market is negative and below market return average. Huang Berberis Santos has proven that the relationship between risk and return is not positive in all markets and periods. This relationship is negative in the periods that market return in negative and vice versa. Andrew Ang, Joseph Chen believed that the relationship between risk and return can be tested with other instruments than conditional beta. The most important of these factors is correlation coefficient. If we consider the correlation coefficient as the measure criteria of stock return movement related to each other, the stocks with negative correlation to each other has more expected return than the stocks with positive correlation to each other. Also, they measured the conditional relationship between risk and return using conditional Beta and correlation coefficient (Tavakoli Baghdad Abad et.al, 2010).

Satchell and Hwang (1992) and Siddique and Hervey (2003) developed the negative risk and indicated that if the pricing model is used using negative risk, its performance will be better than the previous models such as CAPM, and they achieved this in US financial markets. Also, Ang, Chen and Xing (2002) expanded the downward gradual changes and through which achieved to a risk reduction factor which can estimate the analogues return rate of stock in US financial markets.

In 2002, an author named Estrada proposed a model as "reduced assets pricing model" which could estimate expected return appropriately in asymmetric markets. Estrada believed that CAPM can estimate expected return up to 38% and D-CAPM up to 55% in asymmetric markets. Accordingly, he conclude that the traditional CAPM model cannot be used anymore to determine stock price in asymmetric markets. And, the new model of D-CAPM should be used. In this model, the semi-variance and negative systematic risk are used instead of variance and systematic risk respectively. Negative systematic risk allow us that with regard to negative fluctuations of asset return and market index than period mean (asymmetric conditions) can determine the market systematic risk and in turn expected return precisely. The objective of this study is:

- Specification of the relationship between P/E and expected return of shareholders ratio based on CAPM model
- Specification of the relationship between P/E and expected return of shareholders

ratio based on CAPM model according to the industry type

- Specification of the relationship between P/E and expected return of shareholders ratio based on CAPM model in automotive industry
- Specification of the relationship between P/E and expected return of shareholders ratio based on CAPM model in pharmaceutical, cement, lime and plaster industry

Research Hypotheses

According to literature, we can made the following hypotheses.

1. P/E ratio significantly related to expected return of shareholders based on CAPM model
2. P/E ratio significantly related to expected return of shareholders based on CAPM model according to the industry type
3. P/E ratio significantly related to expected return of shareholders based on CAPM model in automotive industry
4. P/E ratio significantly related to expected return of shareholders based on CAPM model in pharmaceutical, cement, lime and plaster industry

Methodology

This study is a descriptive one objectively, and a correlational in nature and methodically. And, given that the results of this study can be used by investors' decision makings, it can be considered an applied study. The purposive sampling (systematic elimination) method was used to select samples. Hence, the companies which meet the following conditions (during 2010- 2015) are selected as sample.

1. Full information of companies be available.
2. Financial year of companies is unchanged.
3. The companies are not financial, investment institutions, and banks
4. Operational interruption of the companies not more than 6 month
5. The equity of given companies not be negative during studying periods.
6. Fiscal years of the companies ended in 19 March.
7. The companies' logos are not closed for a long time.
8. The companies which are available at the beginning and ending of the studied period

The data of companies was transferred to Excell program using Rah Award Novin software. Eviews version 9 was used to measure variables and to test hypotheses.

The variables and conceptual model

Research model

$$CAPM = \beta_0 + \beta_1 P/E + \varepsilon$$

Dependent variable

CAPM: Expected return rate of shareholders

Independent variable

P/E

Deterministic factors in price-to-earnings ratio of each share

We can extract the P/E ratio using dividends which is the basis of evaluation in common stock. This process is performed through evaluation model with fixed growth only.

$$P = V_{\varepsilon} = \frac{D_1}{K - g}$$

If we divide the trade parties by expected interest (EI), we have

$$\frac{P}{E_1} = \frac{\frac{D_1}{E_1}}{K - g}$$

This equation indicates the effective factors in estimating the price-to-earning coefficient of each share:

1. Dividends percent,
2. Expected return rate of shareholders,
3. Expected growth rate of dividend

If the other conditions are fixed, the following relation be obtained:

1. The greater the dividends, the larger the price-to-earnings ratio of each share
2. The greater the expected growth rate (G), the larger the price-to-earnings ratio of each share
3. The greater the expected return rate (K), the smaller the price-to-earnings ratio of each share

The objective of CAPM model is to measure this non-removal risk, though it cannot remove the risk, it can predict its level and relate it to expected return rate. The basic formula of CAPM model indicating the relationship between risk and expected return, is

$$K_e = R_f + \beta (R_m - R_f)$$

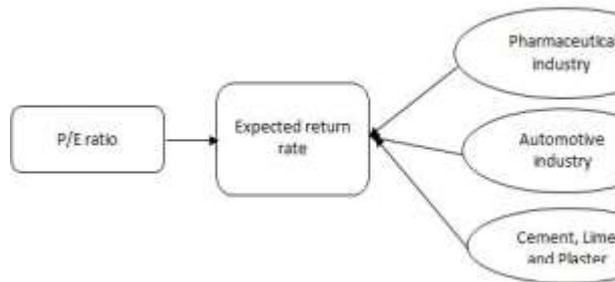
K_e = Expected return of shareholders

R_f = Risk-free return

R_m = Market return

The starting point of this model is risk-free interest rate which the reward is added to it and the shareholders expect it regarding acceptance of additional risk. The additional reward is equivalent with stock market premium, a result of the difference between total market average and risk-free return rate, which is multiplied by stock risk level which was named Beta by Sharp. Beta is the measurement unit of systematic risk which in fact it measure the sensitivity of stock return variability relative to market return variability.

In this study, the five main variables were analyzed. The five variables are: Dependent variables including P/E ratio, Expected return rate of shareholders, and independent variables including pharmaceutical industry, automotive industry, cement, lime and plaster industries.



Results

Descriptive Statistic

In order to better understand the nature of the samples of this study and to be more familiar with research variables, it is necessary that the data is described before analysis. Also, the descriptive statistic is used to recognize their patterns and also it is the basis for defining the relations between variables in a study. In this section, details of measured variables has provided. These variables including mean, median, dispersion indices, standard deviation dispersion indices including Skewness and Kurtosis are provided in the following table.

Descriptive statistic related to research variables				
	Table 1: Total companies		Table 2: Automotive industry	
	Expected return rate of shareholders	P/E ratio	Expected return rate of shareholders	P/E ratio
Mean	0.603137	16.11799	0.549692	31.48377
Median	0.554418	6.068239	0.657704	4.714419
Maximum	3.165185	1332.536	2.902155	1095.076
Minimum	-1.843270	-182.0210	-1.586870	-34.48815
Standard Deviation	0.822113	83.31297	0.917992	126.4043
Skewness			Pharmaceutical industry	6.594457
Kurtosis	3.270990	156.2385	2.938001	52.03699
Jarque-Bera	5.097470	624208.9	0.025780	10958.94
Significance level	0.07818	0.000	0.98719	0.000000
Observations			Cement, Lime and Plaster	102

Descriptive statistic related to research variables				
	Table 3: Pharmaceutical industry		Table 4: Cement, Lime and Plaster industries	
	Expected return rate of	P/E ratio	Expected return rate of	P/E ratio

	shareholders		shareholders	
Mean	0.511233	12.98987	0.559773	5.041467
Median	0.487039	6.146932	0.448917	4.824313
Maximum	2.347228	669.8866	2.604283	13.83410
Minimum	-0.807531	-16.89645	-0.589659	-14.06113
Standard Deviation	0.592270	65.80480	0.611173	3.062449
Skewness	0.515923	9.895735	0.623837	-2.839314
Kurtosis	3.450092	99.29290	3.296991	23.09143
Jarque-Bera	5.385988	41072.10	4.934679	1307.738
Significance level	0.067678	0.000000	0.084810	0.000000
Observations	102	102	72	72

In table 1, the main index is mean indicating the balance point and distribution center, and it is a good index to indicate the centralized of data which is 0.603137 for expected return rate. The median is another central indices that indicate the population status. It also indicates that the half of data is less than given value and the other half is more than given value. The same mean and median value means that the given value is normal. It is 0.554418 for expected return rate of shareholders. Totally, dispersion parameters are criteria to determine dispersion level from each other, or dispersion level than mean. Of the most important dispersion indices is standard deviation which is 0.822113 for expected return rate of shareholders. The skewness is defined as asymmetry level of frequency curve. If the skewness coefficient is zero, the population is symmetric. If it is a positive value, the skewness tends to right, and if it is a negative value, the skewness tends to left. In this study, the skewness coefficient of expected return rate of shareholders is positive and close to zero. It indicates that the distribution is normal and it tends to the right. Kurtosis is defined as the dispersion parameter of Kurtosis level or chamfer of frequency curve

relative to standard normal curve. If the Kurtosis is zero, frequency curve is normal in terms of Kurtosis. If it is a positive value, the curve is boss and if it is a negative value, the curve is wide. In this study, the Kurtosis is positive for all variables. Jarque-Bera test indicates the normality of dependent variable. In this study, it is less than 5.9 for the expected return rate of shareholders variable indicating the normal distribution. The significance level of normality test is more than 0.05 for this variable indicating the dependent variable is normal. The final level indicates the observations.

Stationarity Test

Before to estimate the model, it is necessary that the stationarity of variables should be tested. A variable is a stationary variable when it's mean, variance and autocorrelation coefficient remain constant overtime. Generally, if time start of a variable changes and its mean, variance and covariance remain constant, it is said that it is a stationary variable and otherwise it is a non-stationary variable. In this study, Fisher ADF test is used to recognize the stationarity of variables.

The related hypotheses to the stationarity of variables are

- H0. The variable is non-stationary variable.
- H1. The variable is stationary variable.

The stationarity of variables can be tested in three states including "in surface", "on the first difference", and "on the second difference". The variables that their probability is less than 5% in "in surface" state, the H0 hypothesis is rejected about them and the variable is a stationarity variable in "in surface" state. If it is more than 5%, the variable is a non-stationarity variable. In this case, its stationarity state is located on the "first difference", and if in the said state is still non-stationary variable, its stationarity is located on the "second difference". The results of stationarity test is provided in the tables 5, 6, 7 and 8.

Table 5. Results related to stationarity test of research variables

Variable		Statistic	probability
Expected return rate of	CAPM, it	371.293	0.0000

All companies	shareholders			
	P/E ratio	P/E _{i,t}	- 2.62417	0.0043
Automotive	Expected return rate of shareholders	CA PM _{i,t}	57.9903	0.0063
	P/E ratio	P/E _{i,t}	50.6341	0.0331
Pharmaceutical	Expected return rate of shareholders	CA PM _{i,t}	61.0565	0.0030
	P/E ratio	P/E _{i,t}	45.0203	0.0979
Cement, Lime and plaster	Expected return rate of shareholders	CA PM _{i,t}	50.8300	0.0011
	P/E ratio	P/E _{i,t}	23.1219	0.5126
The first difference			Statistic	Probability
Pharmaceutical	P/E ratio	D(P/E _{i,t})	102.041	0.0000
Cement, Lime and plaster	P/E ratio	D(P/E _{i,t})	37.4734	0.0392

As can be seen in the table 5, the P-value in unit root test in the expected return rate of shareholders and P/E ratio variables is less than 0.05 indicating that the variables are stationarity variables. It means that the mean and variance of variables are constant overtime, and the covariance of variables is constant during 2008 to 2013. Consequently, use of these variables in this research does not cause the false regression. The P/E ratio in pharmaceutical, cement, lime and plaster industries is a stationarity variable on the “first difference” state. Therefore, the used regression is not a false regression.

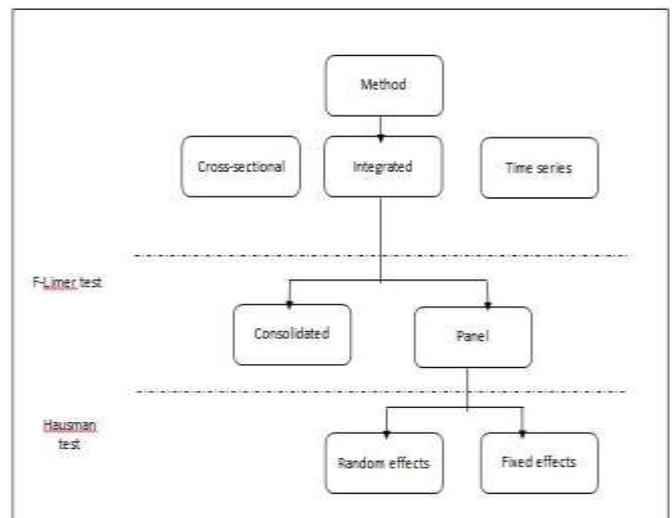
Regression Hypotheses

It is necessary that the normality of dependent variables and homogeneity of variance are confirmed. Otherwise, the results are not reliable which lead to wrong inferences.

F-Limer and Hausman Tests

After testing the stationarity of the variables, we can estimate the model. Data of this study is integrated data. But, before estimating the model, we should specify the estimation method (Consolidated and panel). The F-Limer test is used for this purpose. The consolidated estimation method is used for the observations that their test probability is more than 5%, in other words, their test statistics is less than table statistic. And, the panel estimation model is used for the observations that their test probability is less than 5%. The panel estimation method is performed using two models including “random effects” and “fixed effects”. To determine which model should be used, the Hausman test is used. The fixed effects model is used for the observations which their test probability is less than 5%. And, the random effects model is used when the test probability is more than 5%. Consider the below graph:

Graph 1 F-Limer and Hausman Tests



Diagnostic Tests of integrated data

Chow and Hausman tests are used to determine the used model in the integrated data. Chow test is used to determine whether to use from panel effects model or random effects model. Its hypothesis are:

H0: Pooled Model

H1: Fixed Effect Model 1

H0 is based on the lack of individual and group effects and H1 is based on the individual and group

effects. Hausman Test is used for determining whether to use of fixed effects model or random effects model. It is done based on presence or absence of the relationship between estimated regression errors and independent variables of the model. If such a relationship exists, the fixed effects model is used and if not, the random effects model is used. H0 indicates the lack of relationship between independent variables and estimation errors and H1 indicates the relationship.

H0: Random effects Model

H1: Fixed effects model 1

F-Limer and Hausman tests are used to determine the method of estimation for the models of 1-7. The results are as follows.

F-Limer and Hausman Tests for the models 1-7

The results of F-Limer and Hausman Tests for the models 1-7 are provided in the table 6.

Table 6 results of F-Limer and Hausman Tests for 1-7 models

Hypotheses	Model	Test	Statistic value	P-value	Result	
First Hypothesis	CAPM model	F-Limer	2.356229	0.0000	Panel	
		Hausman	0.293636	0.5879	Random	
Second hypothesis	Automotive	CAPM model	F-Limer	3.488035	0.0001	Panel
			Hausman	0.008332	0.9273	Random
	Pharmaceutical	CAPM model	F-Limer	1.757042	0.0514	Consolidated
			F-Limer	0.661118	0.7686	consolidated

As table 6 indicates, F-Limer test probability for pharmaceutical, cement, lime and plaster industries is more than 5% in second hypothesis, so the H0 hypothesis (consolidated model) is confirmed. In other words, its base is on the lack of individual and group effects and we should use consolidated data model to estimate the model. Also, F-limer test probability for first hypothesis and for automotive industry in second hypothesis is less than 5%, so H0 (consolidated model) is rejected. In other words, its base is on the individual and group effects and we should use from panel data method to estimate the model. In next stage, the Hausman test is used to determine whether to use from fixed effects model or random effects model. It indicates that test

probability value is more than 0.05, so H0 (random effects model) is accepted. It means the lack of relationship between estimated regression errors and independent variables. According to Chow and Hausman tests results, we use from random effects model to estimate the parameters.

The analysis of hypotheses

As it became clear, the consolidated model is determined to estimate the model using F-Limer test. Now, we can estimate the models. Used models estimation results are provided in the following section.

First Hypothesis

According to first hypothesis, it is expected that the P/E ratio significantly related to expected return rate of shareholders based on CAPM model.

The first hypothesis is developed as the follows statistically:

H0: There is no significant relationship between P/E ratio and expected return rate of shareholders based on CAPM model.

H1: There is a significant relationship between P/E ratio and expected return rate of shareholders based on CAPM model.

Table 7 results of first hypothesis

CAPM = $\beta_0 + \beta_1 P/E + \epsilon$					
		Estimating coefficient	Standard error	T test	T test probability
y-intercept	β_0	0.621550	0.030205	20.57742	0.0000
	P/E ratio	-0.001142	0.000400	-2.857186	0.0044
Determination coefficient		0.330212	F test	2.460305	Watson-Durbin
Adjusted determination coefficient		0.195996	F probability	0.000000	2.195181

Results of estimation indicates that t test probability is less than 5% for constant and variable coefficients

of P/E ratio and expected return rate of shareholders based on CAPM, so the estimating coefficient of this variable is significant. Determination coefficient indicates the explanatory power of independent variables which it able to explain 33% the dependent variable changes. F test probability stated that whole model is significant statistically. And, since the P/E to the expected return rate of shareholders ratio based on CAPM model remain in the model, the H0 is rejected, i.e. the P/E ratio significantly related to expected return rate of shareholders based on CAPM model.

Regression equation is as the follows:

$$CAPM = 0.621550 - 0.001142P/E$$

Second Hypothesis

Second hypothesis is developed as the follows statistically.

H0: There is no significant relationship between P/E ratio and expected return rate of shareholders based on CAPM model according to industry type.

H1: There is a significant relationship between P/E ratio and expected return rate of shareholders based on CAPM model according to industry type.

Table 8 Results of second hypothesis

CAPM = $\beta_0 + \beta_1 P/E + \epsilon$					
Automotive		Estimating coefficient	Standard error	T test	T test probability
y-intercept	β_0	0.600540	0.078618	7.638729	0.0000
P/E	P/E ratio	-0.001615	0.000701	-2.304393	0.0237
Determination coefficient		0.426825	F test	3.679541	Watson-Durbin
Adjusted determination coefficient		0.310826	F probability	0.00033	2.612179

CAPM = $\beta_0 + \beta_1 P/E + \epsilon$					
Pharmaceutical		Estimating coefficient	Standard error	T test	T test probability
y-intercept	β_0	0.502234	0.056860	8.832765	0.0000
P/E	P/E ratio	0.000693	0.000924	0.749433	0.4557
Determination coefficient		0.252990	F test	1.673430	Watson-Durbin
Adjusted determination coefficient		0.101810	F probability	0.064243	2.164611
CAPM = $\beta_0 + \beta_1 P/E + \epsilon$					
Cement, Lime and Plaster		Estimating coefficient	Standard error	T test	T test probability
y-intercept	β_0	0.486846	0.150880	3.226701	0.0020
P/E	P/E ratio	0.014465	0.026022	0.555890	0.5804
Determination coefficient		0.110358	F test	0.609901	Watson-Durbin
Adjusted determination coefficient		-0.070586	F probability	0.825235	2.346273

Results of estimation suggested that t test probability is less than 5% for constant and variable coefficients of P/E ratio and expected return rate of shareholders based on CAPM in automotive industry. Therefore, the estimating coefficient for this variable is significant. Determination coefficient able 43% explain the changes in dependent variable. F test probability suggests that the whole model is significant statistically. According to this hypothesis, as P/E to the expected return rate of shareholders ratio based on CAPM in automotive industry remains in model, H₀ is rejected, i.e. P/E ratio significantly related to expected return rate of shareholders based on CAPM model in automotive industry.

Regression equation is as follows.

$$\text{CAPM} = 0.600540 - 0.001615\text{P/E}$$

Results of estimation suggests that t test probability is more than 5% for variable coefficient of P/E ratio and expected return rate of shareholders based on CAPM in pharmaceutical, cement, lime and plaster industries. So, estimating coefficient of this variable is significant. Therefore, the first hypothesis is confirmed for of P/E ratio and expected return rate of shareholders based on CAPM in pharmaceutical, cement, lime and plaster industries with 95% probability. Hence, H₀ is rejected, i.e. there is no significant relationship between P/E ratio and the expected return rate of shareholders in pharmaceutical, cement, lime and plaster industries.

Conclusion and Implications

Asset pricing pattern is an adjusted pattern to indicate the relationship between risk and individual assets return. In other words, assets pricing shows that how the assets are priced given to their risk. The basic assumption of asset pricing is that investors are familiar with various methods to find the efficient portfolio, portfolio theory and systematic reduction of risk. They act accordingly and they select one of the efficient portfolios based on their risk aversion degree. Introducing the methods and analysis instruments is one of the most important subjects related to investment culture in current economic conditions of Iran and according to economic policies to change the capital market through reformation of exchange market and fund attraction by directing private sector savings and active participation of it in economic activities. Each of investors seek a different expected return rate from investment in common stock according to their expectations and risk taking level. Using asset pricing model, we can measure the expected return rate of shareholders.

According to research hypotheses, results of first hypothesis suggests that t test probability is less than

5% for constant and variable coefficients of P/E to expected return rate of shareholders ratio based on CAPM model, so the estimating coefficient is significant. Determination coefficient able to explain 33% the independent variables. F test probability suggests that the whole model is significant statistically. According to the hypothesis, as P/E to the expected return rate of shareholders ratio based on CAPM model remain in the model, H₀ is rejected, i.e. P/E ratio significantly related to expected return rate of shareholders based on CAPM model.

The results of this hypothesis is consistent with Izadi Nya et.al (2007). Increased P/E coefficient means reduction of expected return rate of investors. In other words, the investors consider less risk for firm stock and assess its future more transparent. It is expected that expected return of shareholders is considered less based on asset pricing model. In contrast, the shareholders of a firm with low P/E seek high expected return.

About second hypothesis, results shows that t test probability is less than 5% for constant and variable coefficients of P/E to expected return rate of shareholders ratio based on CAPM model in automotive industry. So, estimating coefficient is significant for this variable. Determination coefficient indicates the explanatory power of independent variables, and in this hypothesis, it able to explain 43% of dependent variables. F test probability suggests that the whole model is significant statistically. According to this hypothesis, as P/E variable to expected return rate of shareholders ratio based on CAPM in automotive industry remain in the model, H₀ is rejected, i.e. P/E ratio significantly related to expected return rate of shareholders based on CAPM model in automotive industry.

About third hypothesis, results shows that t test probability is more than 5% for variable coefficients of P/E to expected return rate of shareholders ratio based on CAPM model in pharmaceutical, cement, lime and plaster industries. So, estimating coefficient is not significant for this variable. Therefore, the first hypothesis is rejected for P/E to expected return rate of shareholders based on CAPM model in pharmaceutical, cement, lime and plaster industries. So, H₀ is rejected, i.e. there is no significant relationship between P/E ratio and the expected return rate of shareholders based on CAPM model in pharmaceutical, cement, lime and plaster industries.

Results of this hypothesis is compared with Izadi Nya et.al. (2007) results. It is cleared that in three of five industries, there is no significant relationship between P/E and the expected return rate of

shareholders, but in both cement and automotive industries, the positive relationship between price-to-earnings ratio coefficient and expected return of shareholders is confirmed.

Implications

Pricing patterns of assets is not the only pattern which we can measure expected return rate of shareholders. There are other patterns such as Gordon model that we can yield the expected return rate of shareholders using it. Therefore, study the relationship between expected return rate using other patterns and evaluate their accuracy can be the subject of future studies.

Since, in asset pricing models being paid more to systematic risk and macro-factors effects on market, the expected return which is measured using asset pricing models cannot shows all effective factors on expected return rate of shareholders. So, considering other effective factors such as non-systematic risk on the investors' decision-makings and their expected return rate can be a good subject for future studies.

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