



A Review on the Relation between Systematic Risk and Stock Return Regarding Those Companies Enlisted in Tehran Stock Exchange through Evaluation of Downside Capital Asset Pricing Model (DCAPM) in Different Time Series

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ABSTRACT: Present research aims at investigating the relation between risk and stock return through evaluation of downside capital asset pricing model (DCAPM) in different time series. The method used, was *Correlation* and the statistical populations were all of the companies listed in Tehran Stock Exchange on condition that, be enlisted by the end of March 20, 2006; their fiscal year to be ended by the end of aforementioned date; no interruption of more than 6 months would be made in their stock transactions during the research period; necessary information would be available; and not to be of investment, financial intermediary or holding nature. In order to analyze the data, *Pearson correlation coefficient* was used. The results were indicative of positive and significant relation between historical and future risk of individual stocks and portfolio related to those companies active in Tehran Stock Exchange, during different time scales (excluding time periods 2-4).

Keywords: Systematic Risk, Stock Return, DCAPM, Time series, Tehran stock exchange

ORIGINAL ARTICLE

INTRODUCTION

One of the important points in financial management and investment is risk and the relation existing between risk and expected return. Considering risk factor and its relation with expected return have been always of interest to financial experts. Risk is one of the factors affecting return on assets; shareholders as well as investors need to evaluate sensitivity of their return on assets in relation to risk, so they are always seeking identification, evaluation and control of those factors, having impact on assets (Shahveise, 2010).

Investment is considered as a substantial and necessary factor in economic development process of the country. Consideration of risk and also return by an investor is recognized as an effective factor, upon what they would be investing in. Investors are trying to invest their financial resources in those fields with lowest risk and highest return. This is why; companies have to manage risk alongside return, as those factors restricting maximization of return. In contrary to return, risk forms a subjective and non-quantitative concept. Hence, most economic and financial experts have focused on identification and evaluation of risk (Raie et al., 2004).

In the second half of 20th Century, numerous tests have been made in various conditions regarding stability and systematic risk as the most important factors for innovation of D-CAPM Model, because evaluation of assets' risk in addition to its portfolio was playing the most important part in asset pricing, as

well as assessment of financial performance of managers and financial companies, which is why common variance method was used for risk evaluation.

Negative risk concept as the most important factor of D-CAPM Model, was primarily introduced by Markowitz (1959) after 1950s; in practice however, in 1970s, when negative risk balanced assets' pricing was introduced, concept of negative risk became of interest to the financial managers.

MATERIALS AND METHODS

This paper comprises descriptive method of research and Causal-Comparative (Post-Facto) Research, and is considered an Applied Research in terms of what is aimed at. Statistical populations are all elements and individuals, chosen within a specified geographical scale, bearing common features (Hafez Nia, 1998).

Data used, include information regarding stock return and market index, during the period that systematic risk index was calculated through computer data bases, using Excel spread sheet and the other processed application software, and also data gathered via weeklies, monthlies, as well as yearbooks of Tehran Stock Exchange, for a fiscal period of 5 years (2006-2010).

Expected rate of return (K_j), making use of D-CAPM is:

$$K_j = R_f + \beta_d(R_f - R_m)$$

Decreasing beta (adjusted beta) is calculated via equation mentioned below:

$$\beta = \frac{S_{covRi,Rm}}{S_{var Rm}}$$

Asset co-variance I, in relation to market portfolio in negative risk framework, and also related semi-variance is described as below (Estrada, 2007). For data analysis, Pearson Correlation Coefficient test was applied.

RESULTS

As can be seen in the table 1, shows positive relations between historical and future systematic risks of individual stocks, in those companies under research. At the same time the highest relation (correlation coefficient 0.704) concerns time period of 64-128. The next, is correlation coefficient 0.587, to be

the highest correlation in time period 8-16. The least correlation equal to 0.002 is related to 2-4 time period. So, the research theory as to the positive and significant relation existing between systematic historical and future risk of individual stocks in companies, is confirmed.

The results of table 2, demonstrates positive relation between historical and future risk of portfolios formed from those companies under experiment. Whereas, the highest relation concerns time period of 8-16 with correlation coefficient of 0.849, then comes correlation coefficient of 0.774 relating time period 4-8. The lowest correlation of 0.27 is relating to time period 16-32. Results, confirm the positive and significant relation existing between historical and future risk of stock portfolios in related companies.

Table 1. Historical and upcoming systematic risk correlation coefficient of individual stocks in the companies under research

TIME SERIES	r	p
2-4	0.002	0.9
4-8	0.445	0.002
8-16	0.578	0.001
16-32	0.416	0.004
32-64	0.413	0.004
64-128	0.704	0.001

Table 2. Correlation coefficient of historical and future risk for stock portfolio in those companies under research

TIME SERIES	r	p
2-4	0.746	0.008
4-8	0.774	0.005
8-16	0.849	0.001
16-32	0.270	0.422
32-64	0.632	0.037
64-128	0.665	0.027

DISCUSSION

This research project, is aiming at investigating the relation between systematic risk and stock return through downside capital asset pricing model (DCAPM), in various time series. Results were indicative of positive and significant relation to be existed between historical and future systematic risk of individual stock during different time scales, in respect of those companies listed in Tehran Stock Exchange (excluding time period 2-4). In reality, results represented that only in time period 2-4, this relation is not positive. Whereas, respectively the highest and lowest correlations regarding historical and future systematic risks, concern time periods of 64-128 and 2-4. These results are in conformity with those achieved by BenAmmou et al. (2007), Kim et al. (2007), Gency et al. (2002) and Shahveisi (2010). As

announced by BenAmmou et al. (2007), in short and long term scales, the level of relation between stocks return and systematic risk's is more intensive. On the other hand, results stemmed from the research, showed that long term scales could be appropriate to explain the relation between risk and stock return. As far as long term periods encompass an extended level of changes, they will provide for changing process to be predicted more properly. For the same reason, it seems that long term scales, establish an appropriate trend to explain existing relation between risk and return. This way, estimated betas for individual stocks and stock portfolio in Tehran Stock Exchange are stable enough, and investors should take distance from traditional perspective in selection of their portfolios according to the average return extracted

from previous periods, and also they have to consider beta as an important factor in their decision makings.

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