Original Article

Study and Comparison the Relationship between Risk and Stock Return in Tehran Stock Exchange with Using Fluctuations Models

Hadi Akbarian Rounizi*, Ghodratollah Talebniya and Hamid Reza Vakilifard

Islamic Azad University, Bandar Abbas Branch, Bandar Abbas, Iran

*Corresponding author's e-mail: hadiakbarian33@yahoo.com

ABSTRACT

Present research aims at examining relation between risk and stock return in Tehran Stock Exchange, using volatility models. The research was performed upon correlation method. Statistical population, were indices from those companies accepted in Tehran Stock Exchange. In total, 50 companies were selected and went through statistical analysis. Upon results, the longer the periods of times, the more significant were the relation between risk and return.

Keywords: Risk, Return, Tehran Stock Exchange, Volatility Models

INTRODUCTION

Security markets are the most important way of improved allocation and equipment of capital, as well as investment booming. The major aim of investment is to gain return. Profits or returns of income to the investors are realized through dividend paid, increase of stock price or both. Basically, the investors' fortune is affected through stock price changes and cash profit [1].

The most important factor in choosing securities, are data related to the stock price, stock return and related changes thereto. Investors are sensitive to the stock price and any changes in this regard, so that, they may react in a way or another. So, changes in stock price as a whole is considered as an effective and substantial informational source, to be used in comparative evaluation of a company to another similar ones, evaluation of managers' efficiency, and most importantly, it influences investors' decisions [2].

Risks would be inevitable, however, competitive rules enforces companies and organizations to consider "risk management strategy" more meticulously, and to increase their operational efficacy and competitive advantage in this way. Risk could be considered as a vigorous motivator. Nowadays, failing in risk management could cause losing professional manpower, business partners, markets or income production opportunities, but the worst could be total loss of business operations. Each and every organization goes under challenging risk, however, proper understanding and management of risk, could convert that risk to a competitive advantage. Traditional risk management strategy focuses on recognized and unknown risks' control, to the purpose of minimizing the probability of its occurrence and related costs. Today, management organizations consider the risk as an activating factor of business. This new approach, not only does not treat the risk as a threat, but also recognizes it as a novel opportunity to leverage new products, new services, and modern business models, in addition to unprecedented ways of competition in the market. Now, successful organizations create such strategies to balance risk management through risk itself. This way, innovation would be increased, creating special status for that organization [3].

Capital market in Iran has been studied from forecasting capability point of view [2, 4 and 5]. The research results indicated that stock price distribution in Iranian capital market has not been random and follows a particular pattern. The study as a whole showed that, capital market in Iran lacks efficiency. So, various models could be prepared and provided in order to forecast stock price or return. In nutshell, hereunder, you will find references to some internal researches.

MATERIALS AND METHODS

Present research is experimental, performed upon correlation method. Statistical populations were indices of those companies accepted in Tehran stock exchange, which were supposed to conform to the following criteria:

Not to be an investment, holding or mediation company, in nature.

Not to change their fiscal year during research period, their fiscal period shall be ended up on the last day of Iranian year (April 10).

To be persistently active in stock exchange within time period of 2004- 2011.

To provide complete data regarding their company in accessible form.

Total market's return has been considered as dependent variable in this research. In each period of time, return on total investment is equal to the balanced mean of return rate for each investment within a set of investments. To evaluate the mean, we have to give weight or coefficient to each of investments according to the percentage of our own investment in that group; e.g. if this set of investments contains M securities, then the expected market rate could be extracted through equation mentioned below:

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Which; x_j and $E_{(Rj)}$ are respectively indicative of the number and value of each stock.

Risk factors in this research are considered as independent variables; since the stock price is recognized as the most significant factor affecting stock return, so the conditional variance of total price index (risk index) has been used as independent variable of this research.

Required data for testing research theories have been gathered via Tehran Stock Exchange organization's website and include statistics for total index (TEPIX-Tehran Price Index) , industry index, price and cash profit index(TEDPIX), cash profit index (TEDIX), top 50 companies indices (TX-50), main board as well as secondary board indices.

RESULTS

As specified by the first table and chart (above), continuous and slow growth of total return of market could be seen from 2004 to the March 2006, and from this point along with developments in land and housing market and considerable increase of prices in alternative markets, the total return had less growth. However in next years, according to the government's approach for extending capital market as well as increase of number of companies active in stock exchange, total return increase has been affected more intensely. In total return of stock exchange procedure, a return of over 100% could be observed (June 2008 in comparison to June 2009), being indicative of new round of development cycle in stock exchange. The same event, improves a favorable capital market for long term investors and results in real investors' rush for the stock exchange, and downswing of parallel markets such as housing, foreign currency and gold which of course has no consistency over time and from July 2010 shows a downward trend again, that could be interpreted through positive development of housing market and increase of prices.

Table 1. Monthly statistics of price and cash profit index from 2004 to 2011

|	1383	1384	1375	1386	1387	1388	1389	1390
Mar	1977	3394	5451	7956	12084	27997	32324	27015
Apr	2093	3517	5850	8376	13374	27442	32148	27127
May	2158	3625	6004	8701	15293	29166	32309	27643
Jun	2232	3738	6117	9551	19785	32398	30661	27957
Jul	2424	4152	6663	10306	22137	32339	29614	28222
Aug	2516	4332	6509	10377	21248	34219	28864	29519
Sep	2574	4520	6572	9997	20937	33229	27827	29688
Oct	2742	4800	6713	10805	22778	34294	27163	30208
Nov	2842	4854	6947	11101	24820	34301	28937	31217
Dec	2924	4914	7251	11671	36194	33325	28388	31049
Jan	3133	5028	7301	1161	25871	32026	27734	30958
Feb	3266	5221	7501	11345	27074	30762	26851	30786
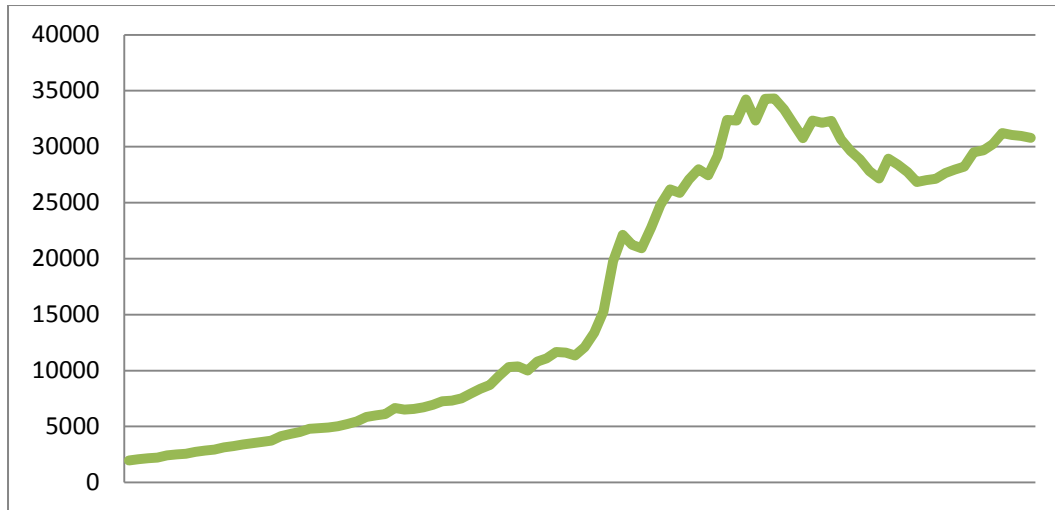
Chart 1. Chart of price and cash profit index for an 8 years procedure

Table 2. Calculated results of the relation between price and cash profit index and condition variance of total price index, using volatility models

Variable	Coefficient	Std. Error	z-Statistic	Prob
C	2,147465	0,405044899	5,301795	1,15E-07
B1	0,031158	0,011133614	2,798572	0,005133
AR(1)	0,281426	0,098066619	2,869748	0,004108
MA(2)	0,015725	0,070664107	2,222528	0,823903
Variance Equation				
C	6,606623	4,581823	1,44192	0,149325
Time Series	0,439561	0,498379	2,000342	0,331654
ARIMA	0,483719	0,343893	2,045811	0,199845
ARCH	0,298715	0,186818	2,022201	0,179043
ARCHQ	0,495235	0,285057	2,001923	0,082331
GARCH	-0,20939	0,19279	2,004671	0,277456
EGARCH	0,221133	0,166513	2,000161	0,184174
TGARCH	0,153412	0,170819	2,002381	0,369134
ARCH M	0,481773	0,394675	2,002381	0,092578

Table 3. Calculated results of the relation between industry index and condition variance of total price index, using volatility models

Variable	Coefficient	Std. Error	z-Statistic	Prob
C	1,620671	0,432907372	3,74369	0,000181
B1	0,029028	0,011658545	2,489805	0,012781
AR(1)	0,315253	0,105661037	2,983625	0,002849
MA(2)	0,074022	0,067794147	1,091859	0,274895
Variance Equation				
C	0,350649	0,502854	0,697317	0,485605
Time Series	0,453997	0,245987	2,109961	0,098123
ARIMA	0,765981	0,215563	2,0056418	0,067834
ARCH	0,394924	0,213835	1,846861	0,064767
ARCHQ	-0,45369	0,1611568	-2,81521	0,004875
GARCH	0,347203	0,1149339	3,02089	0,00252
EGARCH	-0,21368	0,0955145	-2,23711	0,25279
TGARCH	0,569901	0,1967432	2,0561838	0,0045512
ARCH M	0,892551	0,1306847	6,829803	8,50E-12

As shown in tables 2 and 3, in prob. column, the figure of P-value for independent variable of B (1) (condition variance) both for price and cash index and industry index is less that 5%, so the H0 theory shall be rejected with certainty level of 95, and the opposite theory would be accepted representing that "In those companies accepted in Tehran Stock Exchange, the relations between risk and stock return would be possible through volatility models".

DISCUSSION

This research has been performed to the aim of examining and comparing the relation between risk and stock return in Tehran Stock Exchange, using volatility models. The results from estimation of the relation between risk and return through volatility models shows that the longer the time periods, the more significant are the relations between risk and return. This means that in long term, a significant relation has been resulted between risk and return which is not the same, in short term period. Some researchers report some sort of smooth and inconsistent relation existing between risk and return, and the findings hold no exact conclusion in researches done outside the USA. These studies show that either there is no relation between risk and return or there is a shifting relation, there between. Studies regarding pricing model for capital assets were targeted at examination of positive relation between average return and risk, however, they did not take in to account the relation between realized return and risk index ($^{\beta}$) and also the relation between realized market return and risk free rate of return, which are conditional relations.

The results show that, the significance of relation between risk and return tends to change upon transforming values of risk variables (price) which are stemmed from changing conditions of market. In those periods of booming market (continuous growth of market return) there is a positive relation between higher risk and higher return; otherwise, in market downswing (continuous decrease of market return), higher risk may result in lower return.

Eventually, we propose that both booming and downswing market conditions be considered by banks, in time of granting loans to those companies accepted in Tehran Stock Exchange Market. That is, in booming market condition, those companies with high return, should be eligible to receive loans, and in opposite case of downswing market, those companies with lower risk shall be selected by banks, with no consideration of companies' return.

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