



## Studying the Relationship between Risk and Return on Equities in Tehran Stock Exchange Using the Volatility Model

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**ABSTRACT:** The Purpose of this research is to study the relationship between risk and return on equities in Tehran stock exchange using the volatility model. This was a descriptive research performed using the correlation method. The cash return index growth and the industry index were used as measures which showed total return (independent variable). All present companies in Tehran stock exchange were included in the statistical population of this research, fifty of which were selected and included in the statistical sample using the conditioning method. The research data included statistics of total index, industry index, cash return index and the price, and cash return index, the 50-best companies' index, the main board index, and the secondary board index. The results show that the volatility models make the relationships between the risk and the return on equities possible in the accepted companies in Tehran stock exchange.

**Keywords:** Risk, Return, Tehran stock exchange, Volatility Model

ORIGINAL ARTICLE

### INTRODUCTION

The securities markets are the major way for the equipment and an optimal appropriation of investment and investigation prosperity. The main purpose of investment is gaining returns. The benefits and returns gained by the investors occur in the paid profit, an increase in the equities price, or both forms. In principle, investment in stock exchange can influence the shareholders wealth through changes in the equities price and cash profit (Mahmoodi et al., 2003).

Doubtlessly, the most important factor in choosing and making decision is the existence of relevant and timely information. Through an accurate and timely presentation of information, it becomes possible for the investors to make a correct decision to choose the most appropriate and the most beneficial equities. If relevant and timely information is available for the investors, they won't be perplexed anymore and can securely make decisions.

Risk and return are always together in investment and financial support, and they cannot be considered separately because decisions on investment are always made based on the relationship between risk and return (Ghosh et al., 2009). Investors must always keep risk in mind when making decisions on investment. Risk is the amount of variance between the investment's real return and the expected return. Most investors assume that the real return is lower than the expected one. The more distributed is the return; the higher is the risk, too (Kothari et al., 2005).

Predicting the major economic variables has a special importance and position in scientific economic

discussions, and different models have been developed to predict the amounts of future variables in order to help the economic policy makers with making the appropriate monetary and financial policies. That is why most governments and central banks consider long-term and short-term predictions of main economic variables in addition to paying attention to the present condition in making and performing their policies, nowadays (Tucker et al., 2006). There are many factors causing investor's serious perplexity and uncertainty on the financial market's function and reduce their general trust in these markets; therefore, financial policy makers often require an accurate evaluation and predict changes in financial markets prices as a measure for making appropriate policies to reduce the national and global economy's vulnerability. Therefore predicting the changes in financial properties price is one of the most important duties in financial markets that have attracted the researchers and policy makers' attention in the recent two decades in order to use these predictions for the evaluation and pricing financial properties and an optimal appropriation of financial resources and evaluation of risk management's functionality (Asuman, 2009).

### MATERIALS AND METHODS

The cash return index growth and the price and industry index were used as measures showing the total index (the independent variable) in this research. Since the information on some indices is available only for 8 years, an 8-year procedure is used in all

statistical indices for consistency in their statistical amounts and their subsequent analysis. The numeric values of these indices for an 8-year period are collected in the following tables in a monthly basis. The required data to test the research hypotheses is collected from Tehran stock exchange website. The data includes total index, industry index, cash return index and the price, cash return index, the 50-best companies' index, the main board index, and the secondary board index.

The Tehran stock exchange companies must have the following conditions to be included in this research's statistical population:

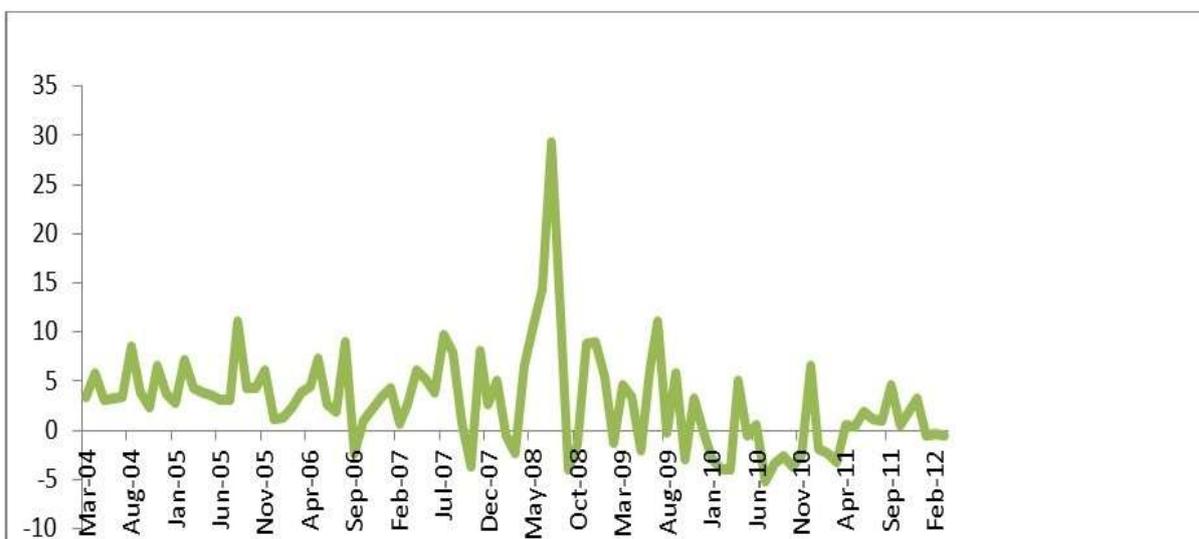
1. It shouldn't be an investing, holding or mediating company.
2. The financial period ends on March 19, and none of the companies should have changed their financial year during the research period.

3. Companies must be continuously active in the stock exchange from 2004 to 2011.
4. Complete information must be available on the companies.

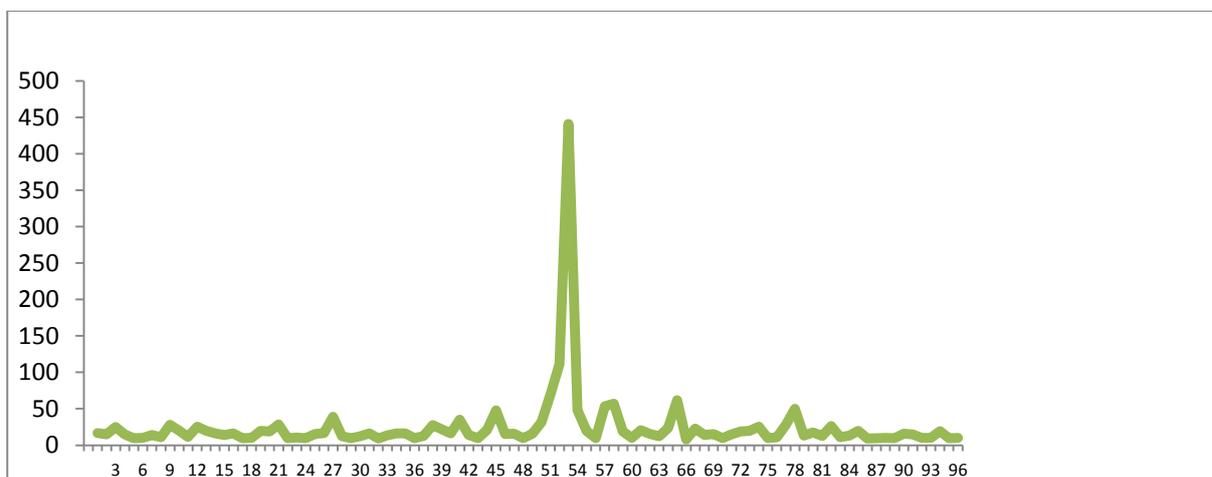
The relationships between risk and return using the 8 proposed volatility models in chapter 1 and the least amount of normal squares regression statistical method is calculated separately to test the hypotheses. Then the results will be compared with each other to identify the preferred method over the other. The statistical population of this research included the accepted companies' indices in Tehran stock exchange.

**RESULTS**

The cash return and price index distribution and the conditional variance for the price total index figures are as follows.



**Diagram 1.** The return index of cash return and price



**Diagram 2.** The conditional variance for the price total index

**Table 1.** 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	Probe
<b>C</b>	2.147465	0.405044899	5.301795	1.15E-07
<b>B1</b>	0.031158	0.011133614	2.798572	0.005133
<b>AR(1)</b>	0.281426	0.098066619	2.869748	0.004108
<b>MA(2)</b>	0.015725	0.070664107	2.222528	0.823903
<b>Variance Equation</b>				
<b>C</b>	6.606623	4.581823	1.44192	0.149325
<b>Time Series</b>	0.439561	0.498367	2.000342	0.331654
<b>ARIMA</b>	0.483719	0.343896	2.045811	0.199845
<b>ARCH</b>	0.298715	0.186818	2.022201	0.179043
<b>ARCHQ</b>	0.495235	0.285057	2.001923	0.082331
<b>GARCH</b>	-0.20939	0.19279	2.004671	0.277456
<b>EGARCH</b>	0.221133	0.166513	2.000161	0.184174
<b>TGARCH</b>	0.153412	0.170819	2.002381	0.369134
<b>ARCH M</b>	0.481783	0.394875	2.002381	0.092578

Research Hypothesis: The volatility models make the relationships between the risk and the return on equities possible in the accepted companies in Tehran stock exchange.

Regarding P in the security level of 95%, the null hypothesis is rejected and the contrary hypothesis which states "volatility models make the relationships between the risk and the return on equities possible in the accepted companies in Tehran stock exchange" is accepted.

## DISCUSSION

The investors have always been interested in recognizing different market dimensions and be informed of the possible dangers that can threaten their capital, and know the amount of their benefit from their investment, too. Therefore, many studies were performed on both areas of risk and return on investment and they have evolved at each level. What is important here is the relationship between risk and return on investment. The results show that the significance of the relationship between risk and return on investment is often changed due to the changing values of risk variables (price) which occurs as a result of changes in market conditions. When market is prosperous (continuous growth in market return), the higher risk is related to the higher return. But if market is depressed (continuous decrease in market return), the higher risk may bring lower return.

The results of estimating the relationship between risk and return using the volatility models show that the longer the time periods are, the more significant this relationship will be. That is, a significant relationship is resulted between risk and return in long-term, while it is not the case in short-term. Based on the researches Sharp (1965) performed together

with Harry Marquette, he divided the factors influencing return and risk of an equities in two parts: those dependent on the company (the nonsystematic risk) and those related to the market (the systematic risk) (Afshari, 2003). Then he proposed a model known as the market model. The most important hypothesis of this model is that changes in individual equities are the result of the whole factors influencing the market.

Regarding the results of this research, it is always necessary to keep different market conditions (prosperity and depression) in mind when analyzing and making decisions. It is also recommended to the investors in Tehran stock exchange to choose the high-value company equities in prosperity condition for investment to gain a higher return, and to invest on low beta equities or contribution securities in depression condition of the market to prevent harm and loss to their capitals and decrease the risk on investment.

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Journal of Accounting and Economics 39 (1)  
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