



## The Review of Relation between the Risk and the Yield of Shares in Tehran Stock Market through Linear Regression Model

Hadi Akbarian Rounizi, Ghodratollah Talebniya and Hamid Reza VakiliFard

Department of Accounting, Islamic Azad University, Bandar Abbas Branch, Bandar Abbas, Iran

\* Corresponding author's Email: hadiakbarian33@yahoo.com

**ABSTRACT:** The purpose of the current research is to study the relation of the risks and yields of shares in Tehran Stock market using the linear auto regression Model. The statistical population of this research is made up of some active companies in Tehran stock. The companies should not be of investing holding and intermediary type has the date March 3<sup>rd</sup> as the end of financial year and has not changed their financial year during the research time. Also the companies should have continues activity in the stock market and the comprehensive information should be available. On this basis 50 companies were selected as research statistical samples. The studied indexes in the research include price and total index and the cash yield of the companies. According to the research results the auto regression model is an appropriate model to quote the relation between the risk and the yield of the shares.

**Keywords:** Risk, yield, Linear Regression Model, Stock

ORIGINAL ARTICLE

### INTRODUCTION

Risk is defined as the difference between the real yield of the investment and the expected yield. Most investors suppose that the real yield will be less than the expected yield. The more the dispersal of the yield is the higher the risk will be (AmiriSoleymani, 2003).

Also yield is the total proportion of income resulted from an investment in a special duration. To the investment that has been spent at the beginning of the period in order to obtain this income. The yield of the shares includes the change in the origin of the capital (change of share price) and the received cash profit (Khorsand et al., 1993).

Having known the relation of the risk and the yield, we will be able to analyze the operation of the companies. Since investment is a two dimensional process based on risk and yield, these factors are the two sides of a coin. In order to make any smart decision, both sides should be evaluated (Saghafi, 2005).

One of famous tactics of modeling of the possible time series is the auto regression integrated moving average, which is a random linear model and one of the oldest models of prediction of time series in economic analysis. It is used for predication of the time series which are not stationary but able to be made stationary through correct order differencing. If a time series changes to stationary type after  $d$  differencing and then we model it as the average of the process of ARIMA (p,q), then the main time series will be the accumulated auto regression integrated moving average ARIMA (p,d,q) in which  $p$  stands for the number of auto regression sentences,  $d$  for the number of first degree differencing until the time

series is stationary and  $q$  for the number of the moving average. Therefore, an ARIMA (2,1,2) time series should be modeled by a process of ARIMA (2,2) after one first degree differencing. More clearly, it should include two AR (2) auto regression and two MA (2) moving average. In order to estimate a time series through the autoregressive integrated moving average model, the Box-Jenkins methodology is used. It includes four steps: specification, estimation, diagnosis control and prediction (Etemadi et al., 2005).

The importance of this research is that it provides the managers more abilities for analysis and for risk analysis especially. It will be able to empower the insight of the managers in the market rises and downfalls through analyzing factors like the company size and season effects. Efficiency and non-efficiency of the market, effects of wealth, operations of the managers and reactions to the news and the notices, local and foreign incidents and so on.

### MATERIALS AND METHODS

The current research is of the applicable type which was completed based on the correlation-descriptive method. The population of this research is made of the indexes of the companies accepted in the Tehran Stock. In order to be qualified for this population, Tehran Stock companies should:

1. Not be of an investment, holding and intermediary type.
2. Have March 3<sup>rd</sup> as the end of the financial year and not changed the financial year during the research is held.
3. Have continues activities in the exchange market during 2004 to 2011.

4. Have the comprehensive information available.

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The data needed for testing the hypothesis of the research is collected from Tehran Stock website. The data include cash yield index price and the indexes of 50 companies.

## RESULTS

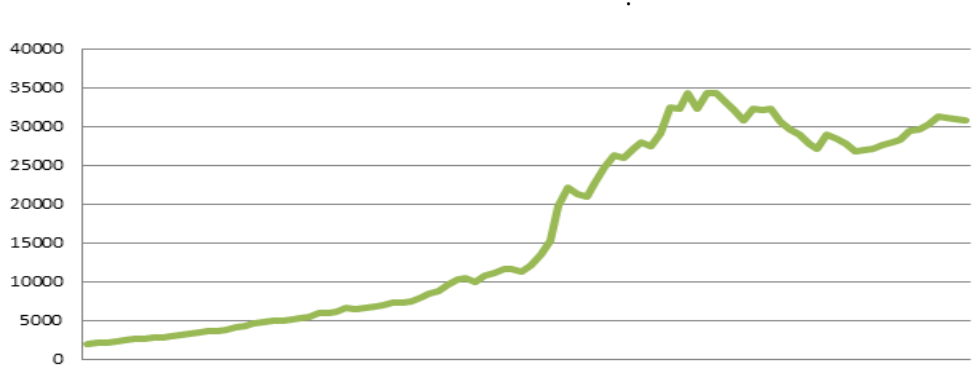
In the research price and cash yield index increase has been used. Since the information of some indexes is available only for 8 years, an 8-year process has been used in all statistical indexes in order to have conformity of the statistical quantities of the indexes and their analysis.

**A. Price and cash yield index:** the numerical quantities of price and cash yield index are

demonstrated on the below schedule for an eight-year period on a monthly basis.

As declared by the schedule 1 and Chart 1 there has been a slow and continuous development in total yield of the market during 2004 until the end of 2005. Since 2006, simultaneous to the evolutions of land and housing market and the remarkable increase in the prices in the alternative markets the total yield has had lower development. But, in the next years given the approach of the government to the development of the capital market and increase of the number of companies present in the exchange the total yield has had a higher rate of increase. In the process of the total yield of the exchange we can also note a yield of more than 100%. (June-July 2008 compared to June-July 2007)

According to the statistical calculations made by SPSS and E-views, as schedule (10-4) shows, in the "Probe" column the amount of p-value for B (1) independent variable (conditional variance) is less than 5% for both price and cash yield index and industry index. So with 95% assurance the  $H_0$  hypothesis is rejected and the contrary hypothesis saying: **"Linear Regression makes possible the relation of the risk and yield of the shares in companies accepted in Tehran Stock."** is accepted.



**Chart 1:** Price and Cash Yield Index for an 8-year Process

**Table 1:** Monthly Statistics of the Price and Cash Yield Index since 2004 to 2011

Month	2004	2005	2006	2007	2008	2009	2010	2011
March	1977	3394	5451	7956	12084	27997	32324	27015
April	2093	3517	5850	8376	13374	27442	32148	27127
May	2158	3625	6004	8701	15293	29166	32309	27643
June	2232	3738	6117	9551	19785	32398	30661	27957
July	2424	4152	6663	10306	22137	32339	29614	28222
August	2516	4332	6509	10377	21248	34219	28864	29519
September	2574	4520	6572	9997	20937	33229	27828	29688
October	2742	4800	6713	10805	22778	34294	27163	30208
November	2842	4854	6947	11101	24820	34301	28937	31217
December	2924	4914	7251	11671	36194	33325	28388	31049
January	3133	5028	7301	11614	25871	32026	27734	30958
February	3266	5221	7501	11345	27074	30762	26851	30786

**Table 2.** Results of Calculation of the Relation between Price and Cash Yield Index and Price Total Index Conditional Variance through Linear Regression

Variable	Coefficient	Std.Error	z-Statistic	Probe
C	3.870032	1.509877	1.899743	1.67E-02
B1	0.087651	1.701466	1.5920562	0.546012
AR(1)	0.645611	1.669401	1.740911	0.080235
MA(2)	0.002349	1.8452107	1.555029	0.890488

**DISCUSSION**

The purpose of the current research was to study the relation between the risk and the yield of the shares in Tehran Stock through the linear regression model. The results show that the meaningful relation of risk and yield are often stricken to changes by changing value of risk variables (price) which results from the changes in market conditions. In the periods in which the market is in a prosperous state (the continuous increase of the market yield), the higher risk is related to the higher yield; but if in a stagnancy state (the continuous decrease of market yield) the higher risk may bring lower yield. Lam (2002), Karyl (2002) and Afshari (2003) presented a model known as capital asset pricing model. In the capital asset pricing model, it is assumed that there is a non-conditional direct (positive) relation between the expected yield of an asset and its systematic risk which is measured by  $\beta$ . Nevertheless the capital asset pricing model tests have used the past realized yields of a long term historical period instead of the expected yields of the next period. So the authenticity of capital asset pricing model and the relation of risk and yield have not been evaluated properly. On the other hand the experimental evidences for the results of capital asset pricing model have been doubted while the results of many researches especially those that were treated as the start point for classical researches approve the capital asset pricing model. Some researches including Fama et al. (1986) report the smooth and incoherent relation between the risk and yield and the findings of the researches held abroad America do not have absolute results. These studies show that either there is no relation between risk and yield or it is not steady. The survey of capital asset pricing model has been administrated with the purpose of testing the positive relation between average yield and Beta risk. But what is ignored here is the relation between the realized yield and risk index (Beta) and the relation between the markets realized yield and the non-risk rate. These relations are conditioned.

At the end Tehran Stock investors are suggested to select the shares of high-value companies for investment in order to get a higher yield in the prosperous status and to invest on the shares with

low Beta or on the bond regardless to the value of the companies' markets in the stagnancy status in order to prevent any loss to their assets and reduce the risks of investment on the shares.

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