

The Investigation of Effective Factors on Stock Return with Emphasis on ROA and ROE Ratios in Tehran stock exchange (TSE)

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ABSTRACT

The stock returns in the capital market are affected by good or bad news received from companies. Recognizing its importance based its efficiency on shares is one the concerns of capital investors and researchers. The aim of this research is investigating the news and information obtained from companies' financial reports of those accepted in Tehran stock exchange (TSE) in financial ratio form and finding the effects of these ratios shares returns. To do this, the financial data of 120 accepted manufacturing companies for time period of 2003 to 2008 was used. The research hypotheses were tested via multivariable regression patterns and delaying variable models at two general and separated by industry levels. Hypotheses tests results show that, at general level, ROA and ROE ratios are effective on stock return, but financial leverage has no significant effect. In the separated by industry level, the results of financial ratios on stock returns are different for each industry that indicate their independency.

KEYWORDS: rate of return on assets, rate of return on equity, financial leverage, stock return.

1. INTRODUCTION

Financial ratios always were used as indexes to compare, analysis, and interpret the financial health of firms and a criterion for investors and researchers to compare financial situation of companies. With attention to needs managers, investors, and researchers to investigate capital markets, several ratios had been created over the time such as current ratio, immediate ratio, inventory in circulation ratio, EPS, DPS and P/E. Each of those ratios indicates the special aspects of company's financial power or weakness according to their structure and forming elements. Given to introduction above a question emerges that, if ROA, ROE, and financial ratios can explain stock return fluctuations? And if yes, which one has the highest efficiency. Another question is that, if they can explain fluctuations in different industries and if this process is similar among all. The target of the research is to investigate the effects of ROE, ROA, and financial leverage which have elements of profit, asset, debt and equity on stock return in the companies accepted in TSE. In addition, this research tries to develop a model based on regression model to better explain effects of financial ratios on stock return and make TSE investors and researchers capable of predicting the value and profitability of stock using its results. Moreover, knowing the process of this model on stock return, managers of accepted companies can control the change of prices and lower the risk of investment and financing. Aghayi & Rezazadeh, (2000) investigated stock return changes in the time of distributing new stocks using cash ratios and their results showed positive increase in capital on stock return.

Ajdari, (2005) investigated the capability of profitability of companies in TSE using financial ratios. He reduced the number of financial factors to obtain fewer factors with lower correlation with each other and meanwhile higher correlation with profitability and then tested the prediction ability of financial ratios such as profitability using multivariable regression. He divided companies in two high and low profitability groups and the results showed financial ratios' high capability in predicting profitability.

Rostami, (2008) investigated the relationship between financial ratios of companies accepted in TSE with their stock return ratios. The results showed the significant relationship between applied financial ratios and stock return ratio in both general and separated by industry level.

Barati, (2009) investigated the application of cash flow ratios in evaluating financial performance of accepted companies in TSE and concluded that the ratios obtained from both flow accounts and cash flow each have specific contents and cannot be replaced; but together offer better understanding of firm's weakness and strength and cash ratios give a good image of profitability, efficiency and debt reimbursement ability of companies.

In order to investigate changes of stock returns using financial accounts data or the financial ratios established from these accounts, this research tries to test the role of the financial ratios which expected to have high effect – based on hypotheses- on stock return.

Research hypotheses

1. The effect of return on assets ratio on accepted companies of TSE is significant.
2. The effect of return on equity ratio on accepted companies of TSE is significant.
3. The effect of financial leverage on accepted companies of TSE is significant.

For each of above mentioned hypotheses, the statistical hypotheses (null and alternative hypotheses) are as follows:

1. The effect of return on assets ratio on accepted companies of TSE is significant.

The effect of return on assets ratio on stock return is zero.

$$H_0: B_i = 0$$

The effect of return on assets ratio on stock return is nonzero.

$$H_1: B_i \neq 0, i=1, 2, \dots, k$$

2. The effect of return on equity ratio on accepted companies of TSE is significant.

The effect of return on equity ratio on stock return is zero.

$$H_0: B_i = 0$$

The effect of return on equity ratio on stock return is nonzero.

$$H_1: B_i \neq 0, i=1, 2, \dots, k$$

3. The effect of financial leverage on accepted companies of TSE is significant.

The effect of financial leverage on stock return is zero.

$$H_0: B_i = 0$$

The effect of financial leverage on stock return is nonzero.

$$H_1: B_i \neq 0, i=1, 2, \dots, k$$

2. LITERATURE REVIEW

More than three decades ago regular and methodical researches had started about effect of accounting information on stock returns but use of these ratios on financial affairs refers to late nineteenth century when comparing current asset with current debt got attention as the first financial ratio. But in the early twentieth century with the development of industry and economy, several important developments occurred in the use of financial ratios; first, accountants and investors noticed that they cannot rely on a single financial ratio and a set of financial ratio are required to investigate investments and analysis. Accounting researchers like Biur (1968), Kaneli (1968), and Rass (1974) believe that, in the decision making process, each accounting data must be used with regards to investment as well as predicting ability, because we cannot make decisions without prediction. Second event was a change in the use of financial ratios to determine a criterion for financial ratios with regards to each industry. Third Event was the use of financial ratios to predict companies' financial problems such as bankruptcy and determining creditors' reimbursement ability. After the emerge of market hypothesis and capital assets pricing model in 1960s and, generally, the impact of these data on stock return by several researchers such as Ball & Beraon (1968) and Wattes & Zemeran (1968), many studies conducted to investigate the effect of accounting information on stock return. O'Conner (1973) investigated the usefulness of financial ratios to investment in common stock. He recognizes return on investment ratio as one of the important factors in decision making and considers the classification and ranking of securities based on return on investment ratio to be useful for decision making. Bilderesi (1980), proposed the use accounting information instead of Beta. He believed that, since accounting information contain several internal and external aspects of company can provide more thoroughgoing information than Beta and emphasized to use of financial ratios along with reports' abstract. Williamson, (1984) investigated the capability of some accounting information to describe price changes and concluded that accounting information available in financial reports can explain stock return variation procedure. Aksus & Eckstion, (1987) investigated the income prediction capability via financial ratios and used both return on investment and return on assets ratios to predict income and resulted that if we divide these ratios to smaller parts the results will be more accurate.

Salmi & Virtanen & Yli Oli, (2001) studied the relationship of financial reports with securities indices and used financial ratios as financial reports' abstracts and examined their relations with stock's Beta and resulted that there is a strong relationship between financial ratios and securities indices and stated that financial ratios based market data or cash ratios obtained from cash flow have lesser relationship with securities indices in comparison with financial ratios which based on the balance sheet and profit-loss account data and known as accrual rates. They mention that it does not imply the lack of relation between cash ratios and securities indices and finally, they recommended that cash ratios along with accrual rates provide more useful and complementary information for users and also other information in financial accounts must be used. Nissim & Pateman, (2002) used financial ratios to investigate securities. They offered a model which derived from securities income evaluation model and have been using financial ratios indicating total income instead of income and through predicting financial ratios their relations with current and upcoming stock value have been predicted. They assumed that according to income evaluation model, profitability and growth determine stock return and cab be used to evaluate securities.

Mormor & Pahor, (2002) studied the nonlinear relationship between stock return ratio and financial ratios in companies and resulted that the financial ratios of these companies and stock return in various industries are different and follow different patterns. Murty & Misra, (2008) examined the cash ratios as indices for studied industries. They investigated 35 successful companies and 35 unsuccessful companies in Delhi between 1977 and 1987 and concluded that, the cash ratio had been an appropriate criterion for evaluating companies' success and their managers can rely on these ratios as indices for financial health status of company. Gilbert & Wheelock, (2011) investigated the profitability of commercial banks using financial ratios and showed that, financial ratios can be widely used to evaluate performance of these banks and provide a statistical model to predict bankruptcy or merging with other companies. These researches show that financial ratios are appropriate alternatives to information contained in financial accounts and increase the capability of predicting profitability, bankruptcy, and stock return ratios of companies; but any of them did not directly examined the effect of financial ratio on stock returns ratios. Among the above mentioned researchers we can mention Aghayi & Rezazadeh and also Williamson. Aghayi & Rezazadeh used financial ratios and Williamson used accounting information to investigate the changes of stock return. In the research of Aghayi & Rezazadeh, since the studied companies were distributed new shares, we cannot generalize their results to all companies in TSE. Moreover, in Williamson's research we cannot say which elements of financial accounts have the higher effect and the main problem there is it's over generalized view on accounting information effective in changes of stock return.

3. METHODOLOGY AND DATA

3.1 Sampling

The required information collected through record observations from all companies accepted in TSE between 2003 and 2008. In this research to we tried test total statistical population, therefor, the statistical population includes companies which their financial year end at Esfand, 29(last day of Iranian calendar) and were active in the above mentioned time period and their financial information were available. Thus, the companies that during this period their financial information were not available were not fully active were eliminated from statistical population.

This research only considered manufacturing and industrial companies and financial services and investment companies were eliminated from statistical population.

Finally, 120 accepted companies were selected after eliminating non eligible companies. With attention to classification of manufacturing companies in TSE and in order to reduce the classifications, the companies with similar activities had put in same group and finally, all industries divided into six groups as follows:

1. Electronic industries;
2. Wood and paper industries;
3. Metallic minerals and automobile industries;
4. Plastics, chemical and textiles industries;
5. Food and sugar industries;
6. Non-metallic minerals including cement factories and tile manufacturing industries.

The required data for research collected via several source such as TSE specialized software and then their validity confirmed by comparing with each other. In this regard the information about accounts, financial ratios, and stock returns of TSE companies derived from Sahra and Tadbir Pardaz softwares, official stocks and securities organization website and the website of Studies Development and Islamic Researches organization affiliated to TSE.

3.2. METHODOLOGY

In the recent years many studies conducted by country researchers in the field of TSE. For example, the researches of Nasrollahi (1996), Vafayi Nejad (1998), Namazi and Shushtari (1999), and Namazi (2006) all confirmed the lack of TSE efficiency in weak level; so with regards to the results of these investigations one can say that there is an information flow in stock market and the information of financial report does not immediately impact the stock prices. Therefore, to test the offered hypotheses we must have this time lag factor in mind.

Given to weak efficiency of TSE and to make the research results more accurate we should also consider financial reports information for stock return changes in the year after that.

To do this the time lag distribution included model were used to insert the effects of independent variables from previous periods.

In this model, the dependent variable is a function of previous values of independent variable, i.e. sum total of harmonic terms (t) and the last term.

Regarding such variables, the general multivariate regression formula is as follows (Ceyok& Almon (lag Model) :

$$y_t = a + b_0x_t + b_1x_{t-1} + b_0x_t + b_2x_{t-2} + \dots + u_t$$

This model is called distribution with lag (time lag) and it must be noted that, although (t) can be infinite but, to make y_t finite we assume that:

$$\sum_{i=0}^t Bi < \infty$$

So the numbers of independent variables are supposed to be limited to one or more periods. In the models with delayed variables we can measure medium-term and long-term effectiveness coefficients.

Effectiveness coefficients, in these models are divided into three groups: 1, Instantaneous coefficients 2, Medium-term coefficients and 3, Long-term coefficients.

Instantaneous coefficients are the results of independent variables simultaneous effects on dependent variable in a period. Medium-term coefficients show the effect of current period plus two previous periods' of independent variables on dependent variables. With attention to the model these type of coefficient are like $B_0 + B_1 + B_2$. Such a sum of coefficients is called medium-term coefficient.

Long-term Coefficients show the cumulative effect of all lag variables applied in the model and exhibited as follows:

$$\sum_{i=0}^k Bi = B_0 + B_1 + \dots + B_k$$

In general, different estimations have been done with combinations of these variables and after examining the results, two lag variables model and financial ratios of t-1 and t-2 periods recognized the best models to estimate the relationship between independent and dependent variables and to this reason, the medium term coefficients of independent variables have been investigated in this model.

Consequently, the appropriate model to evaluate the effect of ROA and stock return using lag variable is as follows.

$$Y_t = a + b_0 \text{roa}_t + b_1 \text{roa}_{t-1} + b_2 \text{roa}_{t-2} + u_t$$

Where,

Y_t , is dependent variable of the research or the stock return in period t. roa_t is return on assets ratio in period t-1 and roa_{t-2} is return on assets ratio in period t-2. The variable, u, is a random invisible variable. Two last variables of the three are lag variables that included in the model.

Similarly, to evaluate the effect of ROE on stock return, the regression model defines as follows:

$$Y_t = a + b_0 \text{roe}_t + b_1 \text{roe}_{t-1} + b_2 \text{roe}_{t-2} + u_t$$

Where,

Y_t is the dependent variable of research or stock return in period t, roe_t , is the return on equity in period t, roe_{t-1} , is the return on equity in period t-1, and roe_{t-2} , is the return on equity in period t-2. The variable u is a random invisible variable. Two last variables of the three are lag variables that included in the model.

To evaluate the effect of financial leverage on stock return, the regression model defines as follows:

$$Y_t = a + b_0 \text{fl}_t + b_1 \text{fl}_{t-1} + b_2 \text{fl}_{t-2} + u_t$$

Where, Y_t is the dependent variable of research or stock return in period t, fl_t , is the financial leverage in period t, fl_{t-1} , is the financial leverage in period t-1, and fl_{t-2} , is the financial leverage in period t-2. The variable u is a random invisible variable. Two last variables of the three are lag variables that included in the model.

Since, the hypotheses must be tested by multiple regression method, for simplicity and accuracy SPSS software and ordinary least squares (OLS) were used.

4. RESULTS

A) Hypotheses test results at all industries level

The hypotheses tested for all companies and results confirm the effect of ROA and ROE financial ratios on stock returns of these companies. The obtained determination coefficient (R^2) shows high correlation between return on assets and return on equity ratios with stock returns of TSE companies, therefore, the null hypothesis or the lack of ROE and ROA effects on stock return is rejected. But, in the case of financial leverage, the obtained determination coefficient (R^2) shows low correlation between financial leverage and stock returns and is near zero. In this test the null hypothesis or the lack of effect of financial leverage on stock return is accepted.

Also, the model's standard error shows lower scattering for ROE and ROA ratios around regression line but financial leverage ratio has higher scattering and error.

Moreover, the model validity and accuracy tests, similar to regression line significance (t) and independent variables coefficients significance (f) tests confirm that regression line and coefficients for ROA and ROE line in most of the years are significant.

Table (1) shows the results of hypotheses tests – the effect of financial ratios on stock returns in the given time period for all industries.

Table (1) Results of the effect of financial ratios on stock returns hypotheses tests for all industries

Base year (x)	Financial ratio	Correlation coefficient R	Determination coefficient R ²	Adjusted determination coefficient R ²	Standard Error (SE)	Result at 95% level of confidence
2005	ROA	0.726	0.527	0.512	28.062	Null hypothesis rejection
2006	ROA	0.809	0.645	0.643	31.620	Null hypothesis rejection
2007	ROA	0.868	0.754	0.746	31.084	Null hypothesis rejection
2008	ROA	0.835	0.698	0.688	28.282	Null hypothesis rejection
2005	ROE	0.809	0.654	0.643	24.000	Null hypothesis rejection
2006	ROE	0.850	0.647	0.636	31.928	Null hypothesis rejection
2007	ROE	0.882	0.777	0.770	29.541	Null hypothesis rejection
2008	ROE	0.879	0.773	0.765	24.533	Null hypothesis rejection
2005	Leverage	0.152	0.023	-0.008	40.330	Null hypothesis confirmation
2006	Leverage	0.099	0.010	-0.022	53.511	Null hypothesis confirmation
2007	Leverage	0.172	0.030	-0.002	62.007	Null hypothesis confirmation
2008	Leverage	0.232	0.054	-0.023	50.308	Null hypothesis confirmation

As also can be seen in table (2) ROE and ROA have significant effect on stock return in the mentioned years, but this is not true for financial leverage and it do not have significant effect on stock returns in any year. The regression significance (t) and regression variables coefficients significance (f) tests, also confirm the significance of ROE and ROA financial ratios at 95% of confidence level and the null hypothesis or the lack of significant effects of ROA and ROE independent variables on stock returns is rejected but, in the financial leverage null hypothesis is confirmed due to lack of effect of financial leverage on stock returns.

Table (2) shows the results of independent variables coefficients and regression significance tests and confirmed hypotheses in each test.

B) Hypotheses test results at separated by industry level

Hypotheses test results at separated by industry level shows that, the effects of ROE and ROA financial ratio and financial leverage for different industries are not same, indicating independency of industries in terms of effects of financial ratios on stock returns in research hypotheses tests. But in the industries with more samples in statistical population such as food and nonmetal minerals industries the test results are closer to general test results.

Generally, the results of effects of the ROE and ROA financial ratios and financial leverage tests on stock returns at all industries level are different with results of the same tests at separated by industry level. While, in the wood and paper industry unlike the total industries, the financial leverage ratio have a high correlation with stock returns. In non-metallic minerals and food industries the results of the financial ratios effects on stock returns are very similar to all industries level results. This can be due to overlapping of information and the size of samples in this industry, i.e. in non-metallic minerals and food industries which have higher samples in statistical population the hypothesis test results are closer to all industries level. According to the weak effect of financial ratios on stock returns at separated by industry level, these test results cannot be used for predicting stock returns; but they can be used by investors and users of financial accounts as a supplement to analyses or to comparison with other stock indices.

Table (2) Independent variables coefficients and regression line significance test results

Base year (x)	Independent variable	Result at 95% level of confidence	Independent variable b ₁ , t test α=0.05	Independent variable b ₂ , t test α=0.05	Independent variable b ₃ , t test α=0.05	F test and sig
2005	ROA	Null hypothesis rejection	Non-significant	significant	Significant	significant
2006	ROA	Null hypothesis rejection	Non-significant	Non-significant	Significant	significant
2007	ROA	Null hypothesis rejection	Non-significant	significant	Significant	Significant
2008	ROA	Null hypothesis rejection	significant	significant	Significant	Significant
2005	ROE	Null hypothesis rejection	significant	significant	Significant	Significant
2006	ROE	Null hypothesis rejection	significant	Non-significant	Significant	Significant
2007	ROE	Null hypothesis rejection	Non-significant	significant	significant	Significant
2008	ROE	Null hypothesis rejection	significant	significant	significant	Significant
2005	Financial leverage	Null hypothesis confirmation	Non-significant	Non-significant	Non-significant	Non-significant
2006	Financial leverage	Null hypothesis confirmation	Non-significant	Non-significant	Non-significant	Non-significant
2007	Financial leverage	Null hypothesis confirmation	Non-significant	Non-significant	Non-significant	Non-significant
2008	Financial leverage	Null hypothesis confirmation	Non-significant	Non-significant	Non-significant	Non-significant

5. Conclusion

The purpose of this research was to investigate the effects of return on assets ratio, return on equity ratio and financial leverage ratio on stock return of companies accepted in Tehran Stock Exchange. Results showed that, ROE and ROA ratios have high correlation with stock returns at all industries level and can be used as effective factors on stock return; but financial leverage has no effect on stock returns. At separated by industry level, the effects of ROE and ROA financial ratios and financial leverage on stock returns is different for each industry, indicating the independency of industries in terms of effect of financial ratios on stock returns in research hypotheses.

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