The Relationship between Return on Equity and Investment Opportunities of the Firms Listed in Tehran Stock Exchange

Davood Hassanpoor[1*] and Mohammad Reza Pourali[2]
[1]Department of Accounting, Faculty of Management and Accounting, Gilan Science and Research Branch, Islamic Azad University, Gilan, IRAN
[2]Department of Accounting, Faculty of Management and Accounting, Chaloos Branch, Islamic Azad University, Chaloos, IRAN

Abstract

As all man-made phenomena, businesses and organizations have a life cycle. Investment opportunities have different life cycles during different steps. A highly flexible firm to take advantage of these opportunities expects a clear vision of the future. An effective strategy to provide investment opportunities is to use appropriate dividend policies. The present study establishes a relationship between ROE and investment opportunities. Participants include firms listed in TSE during 1385-1389. Regression analysis is used to test hypotheses. Results suggest a high correlation between variables. Ratios between book value of fixed assets to their market value, market value of common stock to its book value and earnings per share to price per share positively and significantly influence on ROE of the firms listed in TSE. Statistical tests are used to analyze data by Eviews software.

Keywords: Dividend, return on share, return on equity, investment opportunities.

Introduction

Factor considered by investors in their investment is to achieve return. The main goal of investment is practically to achieve return. Return on share depends on changes in price per share at the end of the investment period and received dividend. Dividend is the most common distribution of return through firms to shareholders; however, firms do not similarly act in distributing dividend and adopt different strategies which can cover a spectrum of unpaid dividend to payment of all revenues. An investment opportunity indicates a series of investment policies and strategies which are constantly revised over time. Investment opportunity may include environmental factors providing desirable conditions for the firm such as growing market for (domestic and international) products or competition-restricting factors, changes in exchange rate for interests of the firm, financial situation promising a reliable future for the industry and identification of new market. Management tries to maximize wealth of common shareholders. Return on equity (ROE) ratio is the best standard to measure success or failure of the management in achieving this goal. This ratio emphasizes that return on earning depends on the amount invested by shareholders[1].

Literature Review: Managers recently have defined a new role called as value creation for shareholders. Many factors including globalized capital market, advanced information technology, changed public attitude toward savings and investment and developed investment enterprises have changes attitudes of the management[2].

Regression model of investment opportunities is potential ability of the firm for investments and is measured by following components[3]: i. Investment opportunities, ii. EPS to price ratio, iii. Ratio of market value to book value, iv. Ratio between book value of long-term assets to market value of assets, v. ROE.

$$\frac{EPS}{P} = \frac{\text{earning per share at the end of the year}}{\text{price per share at the end of the year}}$$

$$\frac{PPE}{MVA} = \frac{\text{total market value of common stock}}{\text{book value of common stock}}$$

$$\frac{MVE}{BVE} = \frac{\text{book value of assets, machinary and equipment}}{\text{total market value of common stock} + \text{total value of common stock} - \text{total book value of assets}}$$

market value of assets
$$= \text{total value of common stock}$$
$$+ \text{total book value of common stock}$$
$$- \text{total book value of assets}$$

ROE is calculated by net profit of common equity holders divided into common equity (or its average). ROE is explained here by Palazzo[4], as follows:

$$R = \beta_0 + \beta_1 \frac{PPE}{MVA} + \beta_2 \frac{MVE}{BVE} + \beta_3 \frac{EPS}{P} + \varepsilon$$

where, R represents ROE; $\frac{PPE}{MVA}$ is the ratio between book value of fixed assets to market value of fixed assets; $\frac{MVE}{BVE}$ is the ratio between market value of common stock to book value of common stock; and $\frac{EPS}{P}$ is the ratio of EPS to price per share.

Background: In 1999, Sanji and Mark studied the relationship between investment opportunities and realized return followed by studies of Gul and Tsui[5] to analyze effects of investment opportunities, free cash flows and firm size on liability strategy. They found that these factors were significantly related in different levels of investment opportunities of a firm. Whereas, Gul[6] studied the relationship between free cash flows and auditing wedge considering investment opportunities in Hong Kong.

Some authors have focused on liabilities of the firm and their effect on earning or price of the share based on knowledge. Faulkender and Wang[7] final value of an extra dollar decreases regarding its cash at the beginning of the year. That is, the more cash kept by the firm at the beginning of the year, the lower value perceived by shareholders for an extra dollar during the financial year.

Swanson[8] studied the effect of cash on investment value by data from sample firms during 1980-1990. He believed that the cash kept in the firm is of great importance, because the firm accessed to good visions for its future performance. This is inconsistent with Jenson testing views of investors by studying investment return on those portfolios generated by transactional strategies based on cash and predictions of liquidity in the future. To analyze transactional strategy used in his study, he compared the portfolio related to high-liquidity and low-liquidity firms. Results indicated that investors rewarded firms which reported lower cash in their balance sheets. This is inconsistent with the fact that more cash need to be maintained in confronting financial limitations.

Khademi[9] studied the relationship between investment opportunities and growth of assets in firms listed in TSE during 1998-2005. He used three standards to measure investment opportunities. According to conducted studies, there was a significant relationship between these three standards considered for investment opportunities and growth of assets. Manipulating these standards can achieve higher level of growth for assets.

Considering the fact that firms with profitable investment opportunities and more growth distributed lower percentage of their profit among shareholders to supply required financial resources in order to use in these investment opportunities, the relationship between investment opportunities and dividend was expected to be negative.

Ardakani[10] studied the relationship between dividend and prediction of future earnings using modified CKSS. He believed that a most common way of investment was to purchase shares of different firms by real individuals and legal entities. Thus, en essential requirement to make sure of investment and its profitability particularly during future years was to access valid and real-time information. Directors also needed an instrument

to deliver information and future goals to shareholders. Therefore, Ardakani[10] studied the relationship between dividend size and accuracy of predictions of future earnings in firms listed in TSE during 2000-2006. In this regard, six hypotheses were developed according to literature review. The hypotheses were analysed by multivariate regression in CKSS model and t-tests. Results indicated dividend did not influence on accuracy of predicted future earnings.

Hypotheses: Main hypothesis: There is a significant relationship between ROE and investment opportunities in capital market.

Marginal hypotheses: i. There is a significant relationship between ROE and the ratio between book value of fixed assets to their market value. ii. There is a significant relationship between ROE and the ratio between market value to book value of shares. iii. There is a significant relationship between ROE and the ratio between EPS to price per share.

Methodology

Participants, Samples and Sampling Method: Participants included all firms listed in TSE from 2007 to late 2011. The sample was selected based on following conditions: i. Their financial year ended at 20 March 2011; ii. They were not financial firms such as banks, insurances, investment firms and financial intermediaries; because structure of their firms is considerably different; iii. The firms were listed in TSE before 2007 and continuously transacted; iv. The firms did not change financial year during studied period; v. The required financial information was completely available.

Data Analysis: The used method of this study was descriptive correlation. Data was based on financial information of the firms listed in TSE. The methodology was retrospective; that is, the study was based on previous information. It also was a functional research. Statistical analyses were run by Eviews software. Regression analysis and correlation based on panel data were used to test hypotheses. Significance of models was measured by coefficient of determination (R^2), correlation coefficient and t-statistic. Correlation analysis or consistency include all methods which discover or determine the relationship between different variables using regression model and correlation. The correlation analysis studies changes in one or more variable along with changes in several other variables.

The Model

$$R = \beta_0 + \beta_1 \frac{PPE}{MVA} + \beta_2 \frac{MVE}{BVE} + \beta_3 \frac{EPS}{P} + \varepsilon$$

where, R represents ROE; $\dfrac{PPE}{MVA}$ is the ratio between book value of fixed asset to market value of fixed assets; $\dfrac{MVE}{BVE}$ is the ratio between market value of common stock and book value of common stock; and $\dfrac{EPS}{P}$ is the ratio of EPS to price per share.

Tests Related to Model Estimation: *Different tests have been developed to determine the used model for pooled data. Hasuman test is used to choose the proper model between two models of fixed effects and random effects. Chow testis used to choose between pooled regression model and fixed effects [11]. Assumptions of this test are as follows:*

Intercepts are equal: $H_0 : \alpha_1 = \alpha_2 = \dots = \alpha_{n-1} = 0$

At least one intercept is different: $H_1 : \alpha_i \neq 0$ $\exists_i \in 1, \dots n-1$

In this test, null hypothesis indicates equal coefficients and intercepts of studied firms; hence, rejected null hypothesis implies panel data (fixed effects) and non-rejected null hypothesis implies pooled data. Results of the test run for each hypothesis suggest rejected null hypothesis and necessity to use panel data by fixed effects for this group of firms.

Hausman test was used for the process of choosing between random effects and fixed effects. This test was developed on correlation between independent variables and individual effects. Null hypothesis can be written as follows:

$H_0 = COV[\alpha_i, x_i] = 0$

$H_1 = COV[\alpha_i, x_i] \neq 0$

If the random error component (individual effect) is correlated to explanatory variables (rejected H_0), random effect model will be biased. In this case, the fixed effect model is required. Results from the test suggest accepted null hypothesis and the necessity to use random effect model.

Stationary Test: Stationary test was used to make sure of results and reality of the relationships existing in the regression and significance of the variables. Unit root of variableswas calculated by EGLS model. Stationary test was conducted by Eviews software, V.6, and Levin, Lin and Chu test, Im, Pesaran and Shin test. Results obtained from stationary test suggest that variables are static; thus, the null hypothesis based on single root of the variables is rejected.

Results and Discussion

This section estimates regression models. The models are estimated by random effects to determine that the model better performs with random effect or fixed effects by Hausmantest which is estimated for four models. Table 1 shows results from Hausman test.

Table-1
Hausman test

Dependent variable (ROE)				
	Statistic t	**Degree of freedom**	**Prob**	**Result**
Hausman test	62.02	3	0.000	The model better performs with fixed effects

Given that, critical level of this variable is less than 0.05; thus, random effects can be used in >0.95 and the model can be estimated by fixed effects.

Table-2
Coefficients of the fitted model for firms

ROE					
Variable	**Variable coefficient**	**Standard deviation**	**Statistic t**	**P-Value**	**Significance**
Intercept	-0.5670	0.0353	-16.0468	0.0000	Significant
PPE	6.7997	0.1789	38.0117	0.0000	Significant
MVE	0.0819	0.0089	9.1540	0.0000	Significant
EPS	1.2542	0.0781	16.0503	0.0000	Significant
Adjusted coefficient of determination	%98		Durbin-Watson		2.30

Significance is considered in 95%.

As findings show, the intercept was significant (table 2). The ratios between book value of fixed assets to their market value, market value of common stock to book value of common stock and EPS to price per share are positively and directly related to ROE. On the other word, increase in these variables increases ROE.

Adjusted coefficient of determination is calculated as 98% indicating that 98% of changes in dependent variable (ROE) is a function of independent variables. The model also estimates Durbin-Watson statistic supporting that there is no self-correlation in the model. The next section discusses components of the model disturbance.

Figure 1 indicates that disturbing components do not follow particular order during their time period; this implies that there is no self-regression between disturbing components. The next diagram shows histogram of residuals.
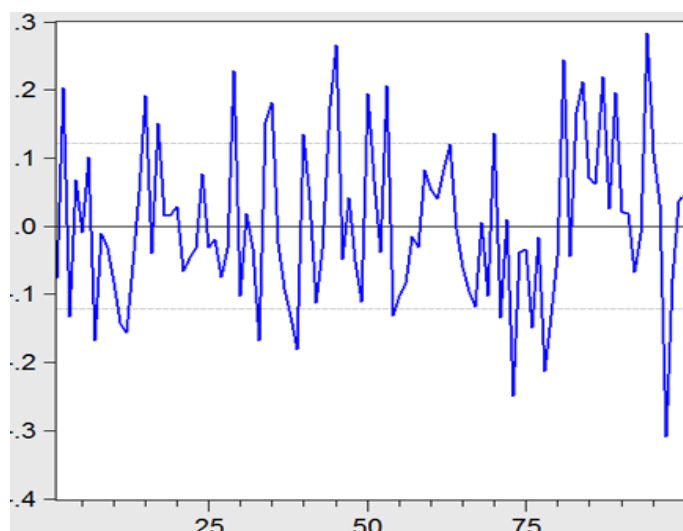

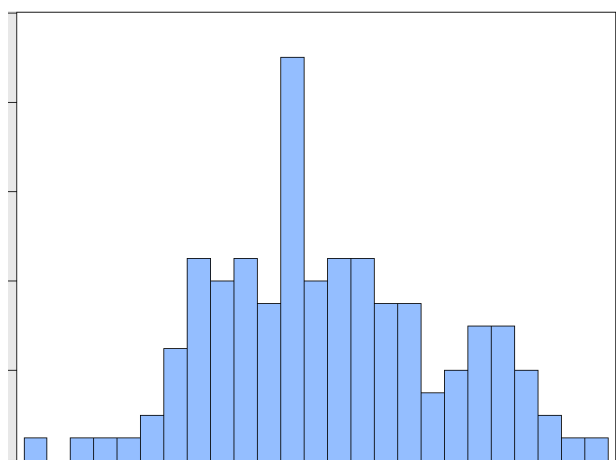**Figure-1**
Residual values of the regression

Figure-2
Histogram of residuals

The histogram depicted in figure 2 is related to disturbing components of fitted model. This diagram represents a clearer picture of matching the diagram with normal distribution which itself is an evidence to absence of self-regression between disturbing components.

To investigate stability of estimated coefficients, CUSUM and CUSUMSQ graphical tests can be used for residual terms. These tests are graphically performed as shown in figure 3 and figure 4.
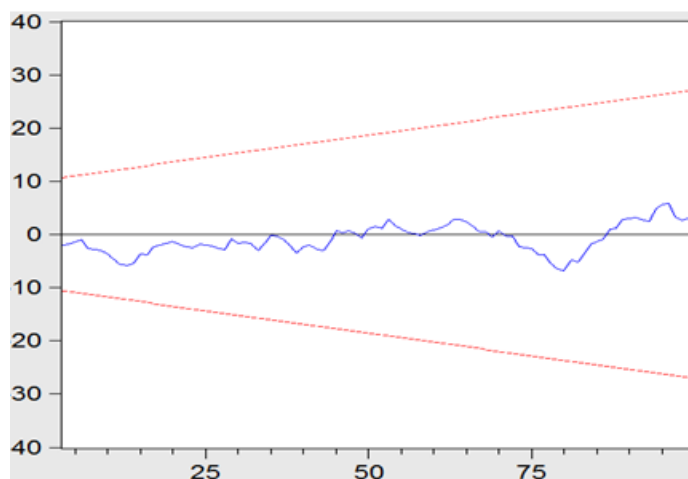

Figure-3
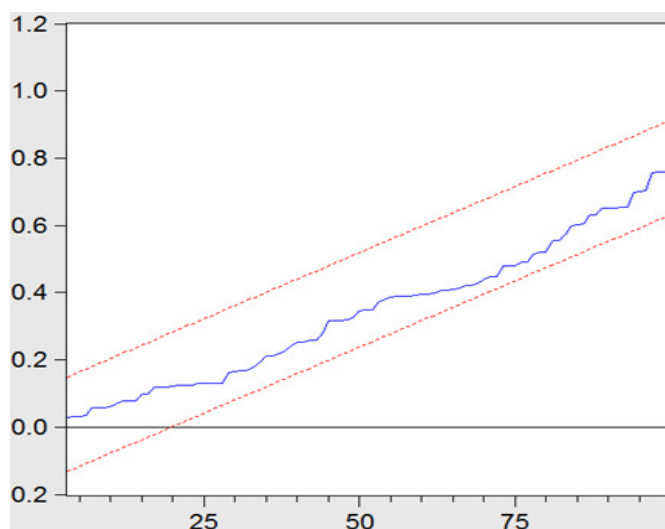**CUSUM test for estimated model (horizontal variable: firms; vertical variable: residual)**

Figure-4
CUSUMSQ test for estimated model (horizontal variable: firms; vertical variable: residual)

As above Figures show, CUSUM and CUSUMSQ diagrams are in an area between two critical line in 5% suggesting a reliable stability for the model.

Conclusion

Potential advantages of purchasing shares for investors result from two sources; the first, EPS received by investors in cash or non-cash or earnings in the form of shares while keeping investment; the second, increased price per share over time to finished cost of shares for the investor. The former results from a profit distributed annually by firms between shareholders; however, the latter is related to ability of the business to provide investment opportunities. Above interests are interrelated. Even if the business does not provide profitable investments and opportunities in long term, they will not be able to pay EPS to shareholders. Hence, both potential and actual investors and firms as investable businesses are interested in identifying investment opportunities.

The growing opportunities indicate potential of the firm in future investment and profitability and investment opportunities allocate financial resources of the firm to earn money or decrease costs. Therefore, firms are expected to implement regularly financial policies for investment opportunities.

References

1. Islami Bigdeli G. and Bidgolo M., The Contrast between Return and Risk of Alternative Investment Opportunities in Iran, *Accounting and Auditing Investigations*, **1(44)**, 149-175 **(2006)**

2. Abzari M., Performance of Firms Listed in Essential Metals Group of TSE Using EVA Model and Its Relationship with Measures of Profit Accounting, *Financial Studies*, **1(26),** 3-20 **(2008)**

3. Jahankhani A. and Zarif Fard A., Do Managers and Shareholders Use a Proper Standard to Measure Value? *Financial Studies*, **2(7,8),** 41-66 **(1995)**

4. Palazzo D., Firm's Cash Holdings and the Cross–Section of Equity Returns, Department of Economics, New York University **(2009)**

5. Gul F.A. and L Tsui J.S., A test of the free cash flow and debt monitoring hypotheses: Evidence from audit pricing, *Journal of Accounting and Economics*, **24(2)**, 219-237 **(1997)**

6. Gul F.A., Government share ownership, investment opportunity set and corporate policy choices in China, *Pacific-Basin Finance Journal*, **7(2),** 157-172 **(1999)**

7. Faulkender M. and Wang R., Corporate financial policy and the value of cash, *The Journal of Finance*, **61(4),** 1957-1990 **(2006)**

8. Swanson Z.L., Impact of Cash holdings on Investment Value. Working paper, Kelley School of Business, Indiana University**, (2006)**

9. Khademi G., The Relationship between Investment Opportunities and Growth of Assets in Firms Listed in TSE (7th ed.), Tehran: Studies on Educational Planning, **(2009)**

10. Ardakani I., The Relationship between Dividend and Prediction of Future Earnings Using Modified CKSS, M.A. Thesis, Islamic Azad University of Neyshaboor **(2010)**

11. Yaffee R., A primer for panel data analysis. Connect: Information Technology at NYU, **(2003)**