

The Relationship between Earning, Dividend, Stock Price and Stock Return: Evidence from Iranian Companies

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Abstract. The purpose of this paper is to investigate whether the current period earning divided by stock price at the beginning of the stock market period, current period dividend divided by stock price at the beginning of the stock market period, prior dividend divided by stock price at the beginning of the stock market period and the reverse of stock price at the beginning of the stock market period are relevant to explain stock market returns in Iran. We used cross-section, pooled data and panel data regression models for testing the effects of the above variables on stock returns. The results show that in some years, shareholders pay special attention to dividends and also the variable prior dividend divided by stock price at the beginning of the stock market period affects stock return. Moreover, there is a significant relationship between current period earning divided by stock price at the beginning of the stock market period and stock return. Thus, results theoretically support the existence of relationship between earning, dividend and stock return.

Keywords: Earning, Stock Return, Tehran Stock Exchange, stock price, earning per share

1. Introduction

Regarding the specific characteristics of corporations, the number of these companies is increasing. Whereas stockholders are one of the main components of corporation, their requirements should be remarked. The primary focus of financial reporting is earnings information and its components. Investors and shareholders tend to be aware of firm performance, investment returns and stock returns. Due to this fact that stock return is an influencing factor that effects economic decisions such as buying and selling shares therefore this is the researchers' duty to identify these factors that have effect on stock returns of companies. There are three theoretical links between financial reporting (especially earning) and stock return (Nichols & James, 2004). These links depends on three assumptions about the information contained in earnings and share prices: 1) current period earning provides information to predict future periods' earnings, 2) It provides information to develop expectations about dividends in future periods and 3) It provides information to determine share value, which represents the present value of expected future dividends (Beaver, 1998). This research investigated the relationship between earnings and stock return based on Easton and Harris (1991) Model, Lintner's Dividend (1956) Model and Gordon's Growth (1959) Model. According to this fact that stock return is the most important issue for investors in the capital market, this study aims to prepare the criteria for investors to make the better decisions and answer these three questions:

- [1] Whether the current period earning per share to beginning stock price ratio affects stock returns or not?
- [2] Whether dividend per share of current period to beginning stock price ratio affects stock returns or not?
- [3] Whether beginning reverse stock price and prior dividend per share to beginning stock price ratio affects stock returns or not?

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Investor's objective of investing in firms' stock is obtaining reasonable stock return and the stock market can be activated only if investors achieve their requirements. Therefore, one of the duties of researchers is helping investors to explain and forecast stock return. Thus this study motivated to explain the effects of current period earning per share to beginning stock price ratio, current period dividend per share to beginning stock price ratio, prior dividend per share to beginning stock price ratio and the beginning reverse stock price on stock return among companies listed on Tehran stock exchange. This research is contributed to literature in two ways: first, it combines beaver (1968) hypotheses in third research hypothesis to represent earnings, dividend and share price together in stock returns model. Second, prior studies assumed that the regression models coefficients are constants while in this study to test the first hypothesis, it is assumed that the intercept and slope coefficient have normal probability distribution and random effects.

2. Literature Review and Research Hypothesis

Companies are able to increase owner's equity by issuing new shares or increasing retained earnings. The important point is that if the new shares will be published, what rate of return must be used by company to satisfied new shareholders? cost of equity can be calculated through using several theories and models which includes capital asset pricing model, risk premium model, non growth model, Gordon growth model and Easton & Harris model. There are some studies that have done about stock return. Easton & Harris (1991) were considered the earning as an explanatory variable for returns. They investigated whether prior period dividend to beginning stock price ratio can explain stock return or not? In other words, is it possible to predict future dividend and stock price through dividend or not? It was concluded that earning is an important elements for stock valuation and it can be used as an explanatory variable for stock return. Fama & Babiak (1968) did research on dividend policy of 392 companies. They tested the Lintner's model and they were developed four other models. Their results show that the dividend policies are independent from investment policies. Thus, Fama & Babiak accepted the Lintner's opinion that the dividend policy is independent from investment policy. Jindrichovska (2001) reported a statistically significant relationship between returns and accounting data for the developed Czech stock market, supporting the evidence from previous studies such as Kothari and Zimmerman (1995) that stock prices lead earnings. Jarmalaite (2002) examined the relationship between accounting numbers and returns in the Baltic stock markets. The stock markets of three countries were investigated: Lithuania, Latvia, and Estonia. Evidence from this study suggested that the association between returns and earnings differs substantially among the three countries. Estonia shows the highest value relevance while Lithuania shows the lowest. The association in Latvia seems to be very similar to Estonia but it has high standard errors making the results less acceptable. Despite the numerous studies in explaining stock returns, an optimal and consistent model has not provided yet. Thus, further researches are needed to obtain a comprehensive model. This study attempts to investigate the information content of earning in explaining stock returns for companies listed on Tehran Stock Exchange. With regarding to literature review, the research hypotheses are as follow:

H1: There is a significant relationship between the current period earning per share to beginning stock price ratio and stock return.

H2: there is a significant relationship between dividend per share of current period to beginning stock price ratio and stock return.

H3: there is a significant relationship between beginning reverse stock price, current period earning per share to beginning stock price ratio, prior dividend per share to beginning stock price ratio and stock return.

3. Samples and Research Methods

Research samples are companies listed on Tehran Stock Exchange during 2001 to 2010 that their end of fiscal year should be the end of March and their fiscal period is not changed during the period of research.

For testing the first hypothesis, the model that proposed by Easton & Harris (1991) is used with the difference that they used cross-section regression in their model but in this research, the panel data regression with random effect of slope coefficient and intercept (constant coefficient) is used. Thus, the model for testing first hypothesis is:

$$R_{i,t} = \alpha_{0i} + \alpha_1 \times \left[\frac{EPS_{i,t}}{P_{i,t-1}} \right] + \varepsilon_i + u_{i,t} \quad (\text{Model 1})$$

Where α_{0i} , α_{1i} , ε_i and $u_{i,t}$, respectively are intercept, the slope coefficient of regression model, cross section units error and model's error. It is assumed that in this model, intercept and slope coefficient have random effect and normally distributed with mean zero and follow $\sigma_{\alpha_0}^2$ and $\sigma_{\alpha_1}^2$ variances. Thus, the intercept and slope coefficient have shown with i index. In this study to calculate the stock return (dependent variable), the factors of capital increase have been considered.

For testing the second hypothesis, cross-section regression model presented by Frino & Tibbits (1992) is used (Model 2), where $DPS_{i,t}$ and ε_i show dividend per share of company i at time t and the error of cross-section units respectively.

$$R_{i,t} = \alpha_0 + \alpha_1 \frac{DPS_{i,t}}{P_{i,t-1}} + \varepsilon_i \quad (\text{Model 2})$$

In cross-section studies, data are often collected on the basis of a random sample of cross-sectional units, such as firms (in an investment study analysis) so that there is no prior reason to believe that the error term pertaining to a firm is correlated with the error term of another firm (Gujarati, 2003). The benefit of this type of research is that it can be done relatively quickly as the research data is all gathered at the same point in time. In order to test the third hypothesis, the adjusted model of Easton & Harris (1991) is used. In other word, with combining Gordon Growth model and Lintner dividend model, the new model is achieved. However, in this study due to small number of research periods rather than time series regression model, pooled data regression model is used. The model is:

$$R_{i,t} = \alpha_0 + \alpha_1 \times \frac{1}{P_{i,t-1}} + \alpha_2 \times \frac{DPS_{i,t-1}}{P_{i,t-1}} + \alpha_3 \times \frac{EPS_{i,t}}{P_{i,t-1}} + u_{i,t} \quad (\text{Model 3})$$

For testing the third hypothesis, F-Limer test is used to choose appropriate model and the result shows that pooled data regression model is more appropriate than panel data regression model.

4. Analysis of Results

In order to classifying and calculating variables and for testing the research hypotheses STATA software is used. In panel A of table 1, Pearson correlation coefficient and descriptive statistics including the number of observations, mean value, standard deviation, minimum and maximum amounts of each dependent and independent variables are presented. Referring to table 1, it can be observed that the number of observations (firm-year) is equal to 1080. One of the benefits of this research models is that all variables (both dependent and independent variables) are deficit. Thus the values of variables are homogeneous. Referring to panel B of table 1, there is a direct relationship between all independent variables (earning per share of current period to beginning stock price ratio, dividend per share of current period to beginning stock price ratio, prior dividend per share to beginning stock price ratio and the beginning reverse stock price) and dependent variable (stock return). The highest correlation is between stock return and current period dividend to beginning stock price ratio and the lowest correlation is between stock return and beginning reverse stock price. There is no multicollinearity between independent variables. The results of testing hypothesis are presented in next parts.

Insert table 1 here

4.1. Results of Testing First Hypothesis

Manuscript is accepted for review with the understanding that no substantial portion of the paper has been published or is under consideration for publication elsewhere and that its submission for publication has been approved by all of the authors and by the institution where the work was carried out. It is further understood that any person cited as a source of personal communications has approved such citation. Articles and any other material published in the proceeding represent the opinions of the authors and should not be construed to reflect the opinions of the Editor(s) or the Publisher. The result of testing H1 (Model 1) is summarized in table 2. The number of whole observations is 1080 and the number of companies is 120. Table 2 shows that the result of F-Limer test is significant at 5% level. Thus, H0 is rejected and using panel data regression model is suggested instead of pooled data regression model. Moreover, the results show that significance result for Hausman test is 0.7 at 5% level. Thus, H1 is rejected and panel data regression model

should use in this regard. According to this fact that random effect is considered for intercept and slope coefficient thus, for testing significance of individual coefficients Z test has been used. The significant for the intercept and slope coefficient equal to zero and less 5%. The H_0 (coefficient of all variables are zero) is rejected at 95% confidence level so the results show there is a significant relationship between current period earning per share to prior stock price ratio and stock return. Also according to the coefficient of this variable that is positive and equal to 159.32, it is concluded that there is a positive relationship between this ratio and stock return. The adjusted R-Squared (R^2) equal 48% and it shows 48% of variation in stock return is because of changes in current period earning per share to prior stock price.

Insert table 2 here

4.2. Results of Testing Second Hypothesis

The result of testing H2 (Model 2) is summarized in table 3. Regarding to results, at 95% confidence level and for research years 2002, 2003, 2004, 2006 and 2008 there is a direct and significant relationship between current period dividend per share to beginning stock price ratio and stock return. Considering the amount of P-value or significance of F and T test for years 2006, 2008 and 2009 is 0.1 at 90% level and H_0 is not rejected for these three years. Thus, model 2 is significant just for these years. In order to test heteroskedasticity, Bruch and Pagan's model is used. Table 3 shows that the significant for chi square test is 0.02 and it is not possible to reject H_0 so, variances are homoscedastic.

Insert table 3 here

4.3. Results of Testing Third Hypothesis

The result of testing H3 (Model 3) is summarized in table 4. Due to elimination of heteroskedasticity of variance ROBUST command in STATA software and generalized least squares regression model was used. Also, table 4 shows that the significant for Z-test for current period earning per share to prior stock price ratio is less than 0.05 and H_0 (the variable coefficient is zero) is rejected. It is inferred that this variable affects the stock return and where the adjusted R-Squared is 0.28 thus 28% of stock return variation is because of changes of independent variables in model 3.

Insert table 4 here

5. Discussion and Conclusion

In this research the effect of earning, dividend and stock price on stock return is investigated. For testing research hypotheses, cross section data, pooled data and panel data with random effect models were used. The results of testing first model (earning-stock return model) show that adjusted R-Square is 0.48 and 48% of stock return changes could explained by changes of current period earning per share to beginning stock price ratio. Also, the results of testing second model (dividend-stock return) show that adjusted R-Square is 0.71 for year 2007 but in other years there was not any significant relationship between dividend and stock return. It is supposed that one of the reasons of this result is shareholder's tendency to make investment instead of receiving dividend. Moreover, the results of testing third model (stock price-stock return) show that among three independence variables (earning, dividend and stock price) only earning has effect on stock return. The results of this research is similar to Easton and Harris (1991) shows that prior dividend to beginning stock price ratio affects the stock return and it can be used as an explaining variable for stock return. Furthermore, the result shows consistent with Easton & Harris (1991), there is a significant relationship between current period earning per share to beginning stock price ratio and stock return. Also the results of this research indicate that in some years of study (2002, 2003, 2004, 2006 and 2008) to explaining the stock returns shareholders had special attention to dividend and in other years of study, there was not a significant relationship between these variables. This result supports by Fama and Babiak (1968); Easton and Harris (1991). They mentioned that changing attitudes of shareholders during different years maybe are due to other economic, social and political factors in Iran. Finally, considering the practical aspect of research to explain stock return, there are some suggestions for future research: 1) doing research with emphasis on the time factor and time series regression model, 2) doing research using components of earning

per share instead of earning per share and 3) doing research using components of cash flow rather than dividends.

6. References

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Table 1: Descriptive Statistics

Variables	Mean	S.D.	Min	Max
Panel A: Sample Descriptive Statistics				
R_t	0.1030	0.1200	-1.1751	3.12044
EPS_t	0.1842	0.4728	-4.8051	10.0549
$\frac{EPS_t}{P_{t-1}}$	0.1703	0.6738	0.0000	10.704
$\frac{DPS_t}{P_{t-1}}$	0.2174	0.7757	0.0000	1.95022
$\frac{1}{P_{t-1}}$	0.0003	0.0003	0.0000	0.0024
Observations	1080			
Panel B: Correlation Analysis				
Variables	R_t	$\frac{EPS_t}{P_{t-1}}$	$\frac{DPS_t}{P_{t-1}}$	$\frac{1}{P_{t-1}}$
R_t	1.000	-	-	-
$\frac{EPS_t}{P_{t-1}}$	0.286	1.000	-	-
$\frac{DPS_t}{P_{t-1}}$	0.442	0.095	1.000	-
$\frac{1}{P_{t-1}}$	-0.382	-0.017	-0.420	1.000
Observations	1080	1080	1080	1080

Notes: The sample is consists of 1080 firm-year observations from 2001 to 2010 after eliminating outliers. Stock returns represent annual buy-and-hold for firm i , cumulated from fifth month of fiscal year t to the fourth month of fiscal year $t+1$. To remove the effects of outliers both the dependent and independent variables are winsorized at the top and bottom 10% of their respective distributions.

Table 2: Test of first hypothesis

Variables	Signs	Coefficients	z-Statistics
$R_{i,t} = \alpha_0 + \alpha_1 \times \left[\frac{EPS_{i,t}}{P_{i,t-1}} \right] + \varepsilon_i + u_{i,t}$			
Intercept		14.21	3.77*
$\frac{EPS_{i,t}}{P_{i,t-1}}$ (α_1)	+	1.9731	17.57*
$\frac{DPS_{i,t}}{P_{i,t-1}}$			
P-Value (F-Linear Statistic)	0.00	0.70	
F-Value (F-Linear Statistic)			
Adjusted R ²		0.48	
Observations		1080	
Number of firms		120	

Notes: The sample is consists of 1080 firm-year observations from 2000 to 2009 after eliminating outliers. Stock returns represent annual buy-and-hold for firm i , cumulated from fifth month of fiscal year t to the fourth month of fiscal year $t+1$. To remove the effects of outliers both the dependent and independent variables are winsorized at the top and bottom 10% of their respective distributions. * denote statistical significance at 1% level.

Table 3: Test of second hypothesis

Year	Variables	Coefficients	t-Statistics (p-value)	F-Statistics (p-value)	Adjusted R ²
$R_{i,t} = \alpha_0 + \alpha_1 \frac{DPS_{i,t}}{P_{i,t-1}} + \varepsilon_t$					
2001	Intercept	55.48	5.00 (0.000)	11.37 (0.00)	0.25
	$\frac{DPS_{i,t}}{P_{i,t-1}}$ (α ₁)	91.29	3.37 (0.001)		
2002	Intercept	33.80	4.24 (0.000)	26.88 (0.00)	0.38
	$\frac{DPS_{i,t}}{P_{i,t-1}}$ (α ₁)	105.95	5.18 (0.000)		
2003	Intercept	-76.91	-7.31 (0.000)	105.50 (0.00)	0.68
	$\frac{DPS_{i,t}}{P_{i,t-1}}$ (α ₁)	456.63	10.27 (0.000)		
2004	Intercept	26.62	2.34 (0.021)	2.34 (0.06)	0.20
	$\frac{DPS_{i,t}}{P_{i,t-1}}$ (α ₁)	113.49	1.83 (0.069)		
2005	Intercept	30.14	3.74 (0.000)	9.44 (0.02)	0.22
	$\frac{DPS_{i,t}}{P_{i,t-1}}$ (α ₁)	205.12	3.07 (0.003)		
2006	Intercept	41.50	1.24 (0.210)	0.22 (0.64)	0.05
	$\frac{DPS_{i,t}}{P_{i,t-1}}$ (α ₁)	81.88	0.46 (0.640)		
2007	Intercept	-16.87	-4.56 (0.000)	144.24 (0.00)	0.71
	$\frac{DPS_{i,t}}{P_{i,t-1}}$ (α ₁)	140.21	12.01 (0.000)		
2008	Intercept	20.86	4.02 (0.000)	0.14 (0.70)	0.07
	$\frac{DPS_{i,t}}{P_{i,t-1}}$ (α ₁)	1.57	0.38 (0.706)		
2009	Intercept	14.40	2.96 (0.004)	0.16 (0.68)	0.06
	$\frac{DPS_{i,t}}{P_{i,t-1}}$ (α ₁)	1.28	0.40 (0.687)		

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity:

0.02 (0.90)

Notes: The sample is consists of 1080 firm-year observations from 2000 to 2009 after eliminating outliers.

Stock returns represent annual buy-and-hold for firm *i*, cumulated from fifth month of fiscal year *t* to the fourth month of fiscal year *t*+1. To remove the effects of outliers both the dependent and independent variables are winsorized at the top and bottom 10% of their respective distributions.

Table 4: Test of third hypothesis

Variables	Coefficients	z-Statistics (p-value)
$R_{i,t} = \alpha_0 + \alpha_1 \times \frac{1}{P_{i,t-1}} + \alpha_2 \times \frac{DPS_{i,t-1}}{P_{i,t-1}} + \alpha_3 \times \frac{EPS_{i,t}}{P_{i,t-1}} + u_{i,t}$		
Intercept	25.91	4.27 (0.000)
$\frac{1}{P_{i,t-1}}$ (α ₁)	1405.26	1.06 (0.287)
$\frac{DPS_{i,t-1}}{P_{i,t-1}}$ (α ₂)	1.50	0.31 (0.753)
$\frac{EPS_{i,t}}{P_{i,t-1}}$ (α ₃)	77.70	9.82 (0.000)
χ ² - Statistics (p-value):	97.24 (0.00)	
Adjusted R ² :	0.28	

Notes: The sample is consists of 1080 firm-year observations from 2000 to 2009 after eliminating outliers. Stock returns represent annual buy-and-hold for firm *i*, cumulated from fifth month of fiscal year *t* to the fourth month of fiscal year *t*+1. To remove the effects of outliers both the dependent and independent variables are winsorized at the top and bottom 10% of their respective distributions.