# The Effect of Future Earnings and Free Cash Flow on Dividend

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## Abstract

In economics, and more specifically in contract theory, signaling refers to the act in which one party sends some meaningful information about itself to the other party. Signaling derives from the theory of information asymmetry, which implies a conflict of interest between managers and investors, which reduces the moderating role of dividends; because managers have asymmetric information compared to the investors on the earnings and future dividend policies. This study investigates the relationship between dividends paid and future earnings by considering the free cash flow. For this purpose, 82 companies listed on the stock exchange from 2002 to 2014 were examined. Using the simultaneous equation method, this study finds that increasing the rate of change in future earnings will reduce the annual rate of change in dividends paid. It is also found that the effect of changes in future earnings on changes in dividends is not a reason for the effect of changes in the dividend paid on future earnings.

**Keywords:** dividend changes, dividend signaling theory, free cash flow theory, future earnings changes

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# 1. Introduction

In economics, and more precisely in contract theory, signaling refers to the act in which one party sends some meaningful information about itself to the other party (Nazari et al., 2012). Signaling derives from the theory of information asymmetry, which implies a conflict of interest between managers and investors, which reduces the moderating role of dividends paid because managers have asymmetric information compared to investors regarding the earnings and future dividend policies. The dividend signaling theory states that dividends are used as a signaling tool for the company's future performance. Therefore, the relationship between changes in dividends paid and future earnings is an essential empirical issue in corporate financial research (Liu and Chen, 2015).

Successful companies are often highly profitable. Profits earned by companies can be invested in operating assets, used to acquire new securities, repay debts, or be distributed among shareholders (Amidu and Abor, 2006). Much research has been done on predicting future changes in dividends (rather than future stock returns) using paid dividend changes. However, the findings show that signaling alone is not the cause of the link between paid dividend changes and future earnings changes. However, investors may think that managers always use dividend changes as a signaling tool, thus responding positively to dividend changes without considering that the dividend change may have a reason other than signaling. One of the motivations for managers to change dividends paid can be to maintain more capital for future investments or pay excess cash flow.

Free cash flow represents the company's cash after making the necessary expenses to maintain or develop the assets and distributed them among investors. Free does not mean that the company will distribute the remaining cash to investors, but how it will be used depends on the board of directors and the company's policies (Liu and Chen, 2015). In general, it can be said that in examining the relationship between dividends paid changes and future earnings changes, regardless of motivation. It can be said that dividend distribution itself affects future earnings, but these changes do not have the same effect on future earnings. For example, a company can use undistributed cash for future financing instead of dividing earnings. This is because the distribution of earnings can both reduce the cash available for investment and lead to the loss of positive net present value projects, resulting in lower returns, both of which may lead to a reduction in future earnings (Liu and Chen, 2015). In addition, according to agency theory, dividends reduce the cash available to managers and thus reduce their authority to use cash in low-yield projects. Moreover, dividends increase external financing and more market control over the company, increasing the company's future dividends (Liu and Chen, 2015).

Based on the above and considering that dividends paid do not always cause future earnings changes (based on agency theory and capital structure) and managers' awareness of future earnings changes causes changes in dividends paid (signaling). According to the theory of free cash flow, simultaneous equations that have not been used in previous researches are used in this study. Therefore, this study investigates the relationship between dividends paid and future earnings considering free cash flow and using simultaneous equations. This study examines how the predicted future earnings changes affect the current dividends changes and examine current dividends changes to predict future earnings changes.

# 2. Research method

It was an experimental basic correlational research. The statistical population included all companies listed on the Tehran Stock Exchange in the period 2001-2004. In this research, a systematic elimination sampling method has been used for sampling. Therefore, those companies that do not meet the following criteria are excluded from the statistical sample.

• Companies are not included in the financial and investment industries.
• The fiscal year of the companies should end at the end of March.
• The required information should be available.

Therefore, after applying the above restrictions, the number of sample companies in the present study included 82 companies. Using descriptive statistics for all research variables, descriptive parameters including mean, standard deviation, minimum and maximum are explained, and inferential statistics are used to analyze and test research hypotheses. Then, the Hausman test investigates the problem of possible synchronicity between dividends paid changes and future earnings changes. Since the result of this test is significant, the system of simultaneous equations is used. Besides, since dividends paid do not always cause future earnings changes (agency theory and changes in the capital structure) and managers' awareness of future earnings changes causes dividends paid to change (signaling), so using simultaneous equations, we examine the relationship between dividends paid and future earnings using free cash flow theory and a reciprocal variable is used. We encounter simultaneous equations when one model's dependent variable is an independent variable of another model and vice versa. In this study, the two-stage least squares method (2SLS) has been used to estimate simultaneous equations.

Since the simultaneous equation method has been used in this research, this research's variables have been used simultaneously in one Equation independently and in another equation as a dependent variable. In such cases, the variables are called endogenous and exogenous.

## 2.1. Explaining and measuring variables

*The annual rate of dividends paid changes:* This variable is calculated as the difference between dividends paid per share at the end of this year and dividends paid per share at the end of last year, divided by dividends paid per share end of last year.

*Future earnings change rate:* This variable is obtained from the differences between the earnings of the end of the current year and last year, divided by the book value of equity at the end of last year.

*Free cash flow:* Free cash flow is derived from the differences between the total tax paid, interest paid, ordinary share dividends paid, and operating income before depreciation.

*Rate of free cash flow changes in the last year:* This variable is obtained from the differences between the free cash flow of the last year and two years ago divided by the two years ago' free cash flow.

## 2.2. Explaining and measuring control variables

*Return on equity:* this variable shows the company's efficiency in creating net income for shareholders and is obtained by dividing the net income at the end of last year by the book value of equity.

*Income changes:* this variable is obtained from the differences between net income at the end of the current year and last year divided by the book value of equity at the end of last year.

*Q Tobin's change rate:* this variable is equal to the sum of the common stock market value, the book value of long-term debt, and the book value of current debt at the end of the year divided by the book value total assets at the end of the year.

The purpose of this study is to investigate whether managers change the level of dividends paid to signal future earnings to investors. Therefore, the hypotheses of this research are as follows:

Hypothesis 1: An increase in the predicted future earnings changes leads to an increase in paid dividends.

Hypothesis 2: An increase in free cash flows leads to an increase in paid dividends.

Hypothesis 3: A decrease in investment opportunities increases dividends paid.

Hypothesis 4: An increase in the last period of earnings causes an increase in dividends paid.

In order to test the second, third, and fourth hypotheses, the multiple regression model, according to model (1), is used:

$$R\Delta DIV_0 = \alpha_0 + \alpha_1[(E_T - E_{T-1})/B_{-1}] + \alpha_2 PRFCFCFD_{-1}$$
$$\times |R\Delta FCF_{-1}| \times NR\Delta QD_{-1} \times |R\Delta Q_{-1}|$$
$$+ \alpha_3 NR\Delta FCFD_{-1} \times |R\Delta FCF_{-1}| \times PR\Delta QD_{-1}$$
$$\times |R\Delta Q_{-1}| + \alpha_4 R\Delta E_{-1} + \mu_T$$

Model (1)

Where:

$R\Delta DIV_0$ is the annual rate of change in dividends paid

$(E_T - E_{T-1})$ is the rate of change in future earnings

$B_{-1}$ is Book value of equity

$PR\Delta FCFD_{-1}$ is a dummy variable so that if the rate of change in cash flow at the end of last year is positive, it is equal to one; otherwise, it is zero.

$R\Delta FCF_{-1}$ is the rate of change in cash flow

$R\Delta Q_{-1}$ is the rate of change in Q Tobin

$NR\Delta FCFD_{-1}$ is a dummy variable so that if the rate of change in cash flow at the end of last year is negative, it is equal to one; otherwise, it is zero.

$R\Delta E_{-1}$ is the rate of change in earnings

In order to examine the changes in dividends paid and the future earnings of the first hypothesis based on the theory proposed by Nissim and Zio (2001), the modified future earnings model on equity is used according to model (2):

$$(E_T - E_{T-1})/_{B_{-1}} = \beta_0 + \beta_1 R\Delta DIV_0 + \beta_2 ROE_{T-1} + \beta_3 CE_0 + \varepsilon_T$$

Model (2)

Where

$ROE_{T-1}$ is the Return on equity in year T-1, calculated based on Equation (1):

$$ROE_{T-1} = \frac{E_{T-1}}{B_{T-1}}$$

Eq (1)

$CE_0$ are earnings changes calculated based on Equation (2):

$$CE_0 = (E_0 - E_{-1})/B_{-1}$$

Eq (2)

## 3. Findings:

### 3.1. Hausman Endogeneity Test:

In this test, instead of the endogenous variable's actual values, the estimated values and residues are used. If there is no relationship between the dependent variable, dividends paid changes, and the residual assumed endogenously, is eliminated. The desired relationship can be estimated by the ordinary least squares (OLS) method. The results of the Hausman Endogeneity Test are presented in Table 1.

Table (1) shows that the F statistic value is equal to 19.18 and is significant, which indicates the significance of the Hausman Endogeneity Test. Moreover, the coefficient of the residual (RESID) is significant. Therefore, the endogeneity is confirmed, and a two-stage least squares equation system (2SLS) must be used to examine the relationship between dividends paid and future earnings.

**Table 1.** Hausman Endogeneity Test

| Test results | Sig | T-statistics | Coefficients | Index | | |
|---|---|---|---|---|---|---|
| sig | 0.00 | 9.30 | 93.43 | C | | |
| sig | 0.00 | -8.71 | -64.17 | W | | |
| sig | 0.00 | -3.18 | -2.20 | RESID | | |
| sig | 0.00 | 5.36 | 0.30 | $\mathrm{PRFCFCFD_{-1}} \times \mathrm{|R\Delta FCF_{-1}|} \times \mathrm{NR\Delta QD_{-1}} \times \mathrm{|R\Delta Q_{-1}|}$ | | |
| Not-sig | 0.72 | 0.35 | 0.04 | $\mathrm{NR\Delta FCFD_{-1}} \times \mathrm{|R\Delta FCF_{-1}|} \times \mathrm{PR\Delta QD_{-1}} \times \mathrm{|R\Delta Q_{-1}|}$ | | |
| Sig | 0.02 | 2.31 | 0.42 | $\mathrm{R\Delta E}$ | | |
| 0.58 | Coefficient of determination | | 0.00 | sig | 19.18 | F statistics |

The result of the two-stage least squares estimation is presented in Table 2. According to the results, the coefficient of the future earnings change variable equals -6.08 and is significant. This negative value coefficient indicates the negative effect of future earnings changes on dividend change's annual rate. Moreover, the value of the adjusted coefficient of determination shows that this variable can predict 97% of the variance of changes in the rate of the annual rate of dividends paid.

Based on the results, the cash flow change and Q Tobin change are significant in the first model. Therefore, the second and third hypotheses in this study are confirmed with 95% confidence.

According to the results, the profit changes rate is not significant in the first model. Therefore, this study's fourth hypothesis, which indicates a significant relationship between earnings changes and the annual rate of dividends paid, is rejected with 95% confidence.

According to the information provided, the first model is reported as fitted below:

$$\mathrm{R\Delta DIV_0} = 12.694 - 6.083 \left[ \frac{(\mathrm{E_T} - \mathrm{E_{T-1}})}{\mathrm{B_{-1}}} \right] \qquad \mathrm{Eq(3)}$$

According to the information provided, the second model fits as follows:

$$\left[ \frac{(\mathrm{E_T} - \mathrm{E_{T-1}})}{\mathrm{B_{-1}}} \right] = -0.013 \, \mathrm{CE} \qquad \mathrm{Eq(4)}$$

### 3.2. Discussion and Conclusions

*Hypothesis 1:* An increase in the predicted future earnings changes leads to an increase in paid dividends. The value of the negative coefficient between the rate of change of future earnings and the annual rate of change of dividends paid (-6.08) indicates an inverse and significant relationship. Since the future earnings rate coefficient changes in Liu and Chen's (2015) research is (-0.100) and is significant at the level of 0.01, it can be claimed that the results of this study are consistent with the results of their research. On the other hand, the value of significance level (greater than 0.05) for the dividends variable's annual rate indicates the lack of significance of this variable in the second model. Therefore, the research hypothesis that paid dividends change on the predicted future earnings is rejected. Since the annual rate of change of paid dividends in Liu and Chen (2015) (0.361) obtained at the level of 0.05 is significant, it can be claimed that the results of this study are consistent with their research.

**Table 2.** Results for the system of two-stage least squares equations

| Sig | T statistics | Coefficient | Variable |
|---|---|---|---|
| 0.001 | 3.45 | 12.69 | Intercept |
| 0.026 | -2.22 | -6.08 | $\dfrac{(E_T - E_{T-1})}{B_{-1}}$ |
| 0.188 | 1.13 | 2.57 | $PRFCFCFD_{-1} \times |R\Delta FCF_{-1}| \times NR\Delta QD_{-1} \times |R\Delta Q_{-1}|$ |
| 0.980 | -0.02 | -0.06 | $NR\Delta FCFD_{-1} \times |R\Delta FCF_{-1}| \times PR\Delta QD_{-1} \times |R\Delta Q_{-1}|$ |
| 0.198 | 1.28 | 0.50 | $R\Delta E$ |
| 0.960 | 0.05 | $8.68*10^{-5}$ | $R\Delta DIV$ |
| 0.054 | -1.92 | -0.002 | $ROE$ |
| 0.026 | -2.23 | -0.01 | $CE$ |
| $R\Delta DIV_0 = \alpha_0 + \alpha_1 \left[\dfrac{(E_T - E_{T-1})}{B_{-1}}\right] + \alpha_2 PRFCFCFD_{-1} \times |R\Delta FCF_{-1}| \times NR\Delta QD_{-1} \times |R\Delta Q_{-1}| + \alpha_3 NR\Delta FCFD_{-1} \times |R\Delta FCF_{-1}| \times PR\Delta QD_{-1} \times |R\Delta Q_{-1}| + \alpha_4 R\Delta E_{-1} + \varepsilon_T$ ||||
| 0.97 | The adjusted coefficient of determination | 0.95 | Coefficient of determination |
| $\dfrac{(E_T - E_{T-1})}{B_{-1}} = \beta_1 R\Delta DIV_0 + \beta_2 ROE_{T-1} + \beta_3 CE_0 + \delta_T$ ||||
| 0.62 | The adjusted coefficient of determination | 0.61 | Determination coefficient |

Therefore, it can be concluded that the effect of future earnings changes on paid dividends changes will not be the reason for the effect of paid dividends changes on future earnings changes. Therefore, according to agency theory, dividends do not always cause future earnings changes due to capital structure changes. And there is no evidence to support the signaling dividends paid theory. This result is consistent with the result of Izadi Nia and Soltani (2010). Their findings show that after controlling for nonlinear patterns in earnings behaviors, dividends paid changes do not contain any information about future earnings changes. This study's results are also consistent with Kadioglu and Ocal's (2016) research and Liu and Chen's (2015) research.

*Hypothesis 2:* An increase in free cash flows leads to an increase in paid dividends.

According to the results of Table 2, which shows the estimation of simultaneous equations with the system of two-stage least squares equations, the existence of a relationship between free cash flow changes and paid dividends changes is rejected with 95% confidence. As a result, the research hypothesis that there is a relationship between free cash flow and dividends paid is rejected. It can be claimed that the results of this study are consistent with Alizadeh (2001).

*Hypothesis 3:* A decrease in investment opportunities increases dividends paid.

According to the results of Table 2, since the relationship between free cash flow and dividends paid was not significant, it can be concluded that investment opportunities also do not affect dividends paid. Since in Liu and Chen's (2015) research, the relationship between free cash flow and dividends paid and, consequently, the relationship between investment opportunities and dividends paid is not significant. It can be claimed that this study's results are consistent with their research. This study's result is inconsistent with Bahramfar and Mehrani (2004) and Rezvani Raz et al. (2009).

*Hypothesis 4:* An increase in the profit of the previous period causes an increase in dividends paid, according to the results of Table 2, which shows the estimation of simultaneous equations with the system of two-stage least squares equations. The value of significance level (greater than the significance level of $\alpha = 0.05$) for the variable of profit changes indicates that this variable is not significant in the first model. Therefore, the research hypothesis that there is a significant relationship between earnings changes and dividends paid changes are rejected with 95% confidence. Since the coefficient of

variation of profit in Liu and Chen's (2015) research is equal to (0.001) and is significant at the level of 0.01, it can be claimed that the results of this study do not correspond to their research. This result contradicts the research of Nissim and Zio (2001). Based on the research findings, it is suggested that when adopting dividend policies, the effect of future earnings on paid dividends changes and the lack of effect of paid dividends changes on future earnings should be considered. In fact, it should be noted that the effect of future earnings changes on paid dividends changes will not be the reason for the effect of paid dividends changes on future earnings changes.

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