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EXPLAINING VARIABILITY IN DIVIDEND PAYMENTS: WHAT MATTERS?

Kate Brown, University of Maryland Eastern Shore, USA (kbrown@umes.edu)
Vichet Sum, University of Maryland Eastern Shore, USA (vsum@umes.edu)

ABSTRACT

This paper explores the contribution of various financial measures in explaining the variability in a firm's dividend payments. Ordinary least squares analysis of data from 2003 to 2007 shows that approximately 71% {R^2 = .707, F(4, 6497) = 3.928E3, p < .001} of the variability in dividend payments is explained by the firm's expected growth rate of revenues, earnings before interest and tax, market debt to capital ratio, and effective tax rate. Tests are also performed to detect multicollinearity among the regressors and autocorrelation and heteroskedacity in the dataset. The computed Tolerance and Variation Factor Inflation reveal that multicollinearity is not a threat to the inferences suggested by the regression results. Likewise, the results of Durbin-Watson and Breusch–Pagan tests indicate that autocorrelation and heteroskedacity are absent from the dataset. The findings support theories in the literature that dividends paid by a firm decrease with higher expected growth in revenues, lower earnings before interest and tax, higher debt service requirements, and higher effective tax rates.

Keywords: *Dividend Payments, EBIT, Market Debt to Capital Ratio, Expected Growth Rate in Revenues, Effective Tax Rate*

INTRODUCTION

Dividends paid to shareholders differ among firms across the board. In the framework of signaling and asymmetric information hypotheses, several explanations regarding the variability in dividend payments have been theoretically discussed and empirically documented in the finance literature. Intuitively, one explanation for the level of dividends paid is that higher expected growth in revenues can influence corporate managers to adjust their investment policies by increasing the retention ratio so that they have sufficient internal funds to take on more investment projects that allow them to meet the revenue generation expectations. A similar concept to this intuition is discussed by Lang and Litzenberger (1989) and John and Lang (1991). These researchers contend that a dividend decrease implies that firms are taking on more investment projects, and a dividend increase indicates that management is cutting down investment projects. Benartzi, Michaely, and Thaler (1997) report the same phenomenon. These authors find

that earnings growth rates of dividend increasing firms do not increase, yet decreasing dividend firms experience increased earnings growth rates two years following the announcement of a dividend cut. Grullon, Michaely, and Swaminathan (2002) find that there is a significant decrease in return on assets of firms that raise dividend payout rates. Rozeff (1982) finds that expected future investment is negatively related to dividend payout. Furthermore, Jensen, Solberg, and Zorn (1992) find that managers set dividend levels that allow them to finance expected investments using internal funds.

Actual company earnings are another key determinant of dividend payouts. There is a statistically significant relationship between dividends and earnings (Aharony & Swary, 1980; Asquith & Mullins 1983; Hsu, Wang, & Wu, 1998; Lintner, 1956). Bhattacharya (1979), Miller and Rock (1985) and John and Williams (1985) show that adjustments in dividend payments are linked to changes in earnings. A relationship between dividends and earnings is also reported in other studies (Chen &Wu, 1999; Fama & Babiak, 1968; Watts, 1973, Gonedes, 1978, Lee & Kau, 1987).

The market debt to capital ratio is another possible explanation of the variability in dividend payments. Several papers have found a negative relationship between leverage and dividend payout ratios (Manos, 2003; Nivoix, 2005). This negative relationship is plausible due to the extent that debt and dividends are substitute devices employed by managers to mitigate agency conflicts or asymmetric information problems (Dhillon & Johnson, 1995; Ravid & Sarig, 1991). This implies that an increased market debt to capital ratio reduces dividend payout rates and vice versa.

The tax effect on dividends is also addressed in the literature, with mixed results. Miller and Modigliani (1961) argue that higher dividend tax rates make payouts to stockholders in the form of dividends inferior to other forms such as share repurchases. In other word, paying large dividends is not an optimal policy for firms operating in a regime where tax on capital gains is less than tax on dividend income and where share repurchases are allowed. However, Allen and Michaely (1995) show that firms have rarely repurchased shares but regularly paid dividends. In this case, a dividend tax hike does not influence firms to revise their dividend payout policies and Naranjo, Nimalendran, and Ryngaert (1998) indicate that there is no relationship between the dividend yield effect and the level of tax rate.

As discussed above, the firm's expected growth rate of revenues, earnings before interest and tax, market debt to capital ratio, and effective tax rate are possible determinants of dividend payout. However, a joint estimate of the effects of these variables on dividend payments is not available in the current dividend literature. Therefore, the present study seeks to provide a model which explains the variability in dividends using the firm's expected growth rate of revenues, earnings before interest and tax, market debt to capital ratio, and effective tax rate as explanatory variables. This study adds new knowledge to the dividend literature by offering a model that explains variability in dividend payments and contributes to the further understanding of various factors affecting dividends paid by firms.

DATA AND METHODS

The data were obtained from a publically available set maintained and made available by Dr. Aswath Damodaran of the Stern School of Business at New York University. The particular information used was derived from *Value Line* reports between 2003 and 2007. The data were filtered to eliminate any incomplete records, and a total population of 6502 observations remained. Regressions were run with more variables originally, but the models were refined to eliminate insignificant variables. Dummy variables were included in the original models to determine if there were any differences based on the year, and were all found to be insignificant. Expected growth in earnings per share was also included originally and eliminated as insignificant. This particular result was interesting in that prior research, noted in the introduction above, had found significant relationships between earnings and dividends. The results reported here do suggest a significant relationship between earnings before interest and tax, but not with expected growth in earnings per share. Expected growth in revenues was found to be significant in this model, however. The expected growth figures are provided by *Value Line*, and are the only non-historic figures in the variables used or found to be significant.

RESULTS

As shown in Table 1, approximately 71% $\{R^2 = .707, F(4, 6497) = 3.928E3, p < .001\}$ of the variability in dividend payments is explained by the firm's expected growth rate of revenues, earnings before interest and tax , market debt to capital ratio, and effective tax rate. On average, one percent increase in expected growth in revenues decreases dividends by $380.27. This finding is consistent with other studies documented in the literature that dividend paid by the firm should go down with its higher expected growth in revenues.

A mean increase of $0.13 in dividends is accounted for by a $1 million increase in earnings before interest and tax. This result is confirmed in the literature that there is a positive relationship between earnings and dividends. In addition, dividends, on average, go down by $86.07 for 1 per cent increase in the market debt to capital ratio. The finding adds more information to the literature that there is a negative relationship between the firm's leverage and dividend payment. One percent rise in effective tax rate lowers dividends by an average of $49.02; this information is aligned with the literature that higher tax rates should lower the dividend payout.

Furthermore, tests are also performed to detect multicollinearity among the regressors and autocorrelation and heteroskedacity in the dataset. The correlation coefficients of explanatory variables (See Table 2) show no sign of serious multicollinearity. Additionally, the computed *Tolerance* and *Variation Factor Inflation*, as shown in Table 1, reveal that multicollinearity is not a threat to the inferences of the regression results. Likewise, the *Durbin-Watson statistic* found in Table 1 indicates that autocorrelation is absent in the dataset. Finally, as exhibited in Table 3, the results from *Breusch–Pagan*

test indicate that the problem associated with heteroskedacity in the dataset does not exist.

Table 1

Regression Results Obtained from Regressing Dividends (in dollars) on the Following Variables

Variables	Beta	*t*	Collinearity Statistics	
			Tolerance	*VIF*
Constant	61.02	5.97***		
Expected Growth in Revenues (%)	-380.27	-5.32***	.97	1.03
EBIT (in millions)	.13	124.78***	.98	1.01
Market Debt to Capital Ratio (%)	-86.07	-10.54***	.96	1.03
Effective Tax Rate (%)	-49.02	-2.54**	.99	1.00
R^2		.707		
Adjusted R^2		.707		
F-Statistic		3.928E3		
Durbin-Watson Statistic		1.95		

N = 6501
** Significant at the .01 level
*** Significant at the .001 level

Table 2

Correlation Matrix among Explanatory Variables

Variables	Expected Growth in Revenues	EBIT	Market Debt to Capital Ratio	Effective Tax Rate
Expected Growth in Revenues	1			
EBIT	-.06**	1		
Market Debt to Capital Ratio	-.17**	.10**	1	
Effective Tax Rate	-.02*	.01	-.02	1

N = 6502
* Significant at the .05 level; ** Significant at the .01 level

Table 3

ANOVA Results Obtained from Regressing the Model's Squared Residuals on the Explanatory Variables

Variables	Sum of Squares	*Df*	Mean Square	*F*	*p*
Regression	2.286E15	4	5.715E14	617.897	.000
Residual	6.009E15	6497	9.249E11		
Total	8.295E15	6501			

CONCLUSIONS

The firm's expected growth rate of revenues, earnings before interest and tax, market debt to capital ratio, and effective tax rate are suggested in the dividend literature as likely influences on the level of dividends. Nonetheless, there is not a study in the finance literature that estimates a joint effect of these variables in explaining the variability in dividend payments. As a result, the present study is constructed to provide a model to explain the variability in dividends using the firm's expected growth rate of revenues, earnings before interest and tax, market debt to capital ratio, and effective tax rate as the regressors.

The current study finds that approximately 71% {$R^2 = .707$, $F(4, 6497) = 3.928E3$, $p < .001$} of the variability in dividend payments is explained by the firm's expected growth rate of revenues, earnings before interest and tax, market debt to capital ratio and effective tax rate. The present study adds new knowledge to the body of dividend literature by offering a model that explains variability in dividend payments. The findings support theories in the literature that dividend paid by the firm goes down with higher expected growth in revenues, lower earnings before interest and tax, increased debt service requirements, and higher tax rates.

Tests are also performed to detect multicollinearity among the regressors and autocorrelation and heteroskedacity in the dataset. Correlation coefficients among variables and the computed *Tolerance* and *Variation Factor Inflation* reveal that multicollinearity is not a threat to the inference of the regression results. Moreover, the results of *Durbin-Watson* and *Breusch–Pagan* tests indicate that autocorrelation and heteroskedacity are absent in the dataset.

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