PREDICTING FUTURE EARNINGS GROWTH: A TEST OF THE DIVIDEND PAYOUT RATIO IN THE AUSTRALIAN MARKET

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ABSTRACT

This paper examines the use of the payout ratio as a predictor of a firm's future earnings growth. Recent evidence rejects the hypothesis that firm which retain a large portion of their earnings have strong future earnings growth. Higher dividend payout ratios instead correspond to higher future earnings growth. Examining both listed and delisted firms on the Australian stock exchange over the period 1989 to 2008, we provide further evidence that the dividend payout ratio is positively linked to future earnings growth. The results hold over both one, three and five year periods. Furthermore, our results rejected claims that such a relationship was caused by simple mean reversion in earnings. We find no evidence to support the cash flow signaling and free cash flow hypotheses as an explanation for this relationship.

JEL: G17; G35

KEYWORDS: Predicting Future Earnings Growth, Dividend Payout Ratio, Australian Market

INTRODUCTION

The role of the dividend payout ratio in asset pricing has been given increased attention by numerous authors after Arnott and Asness (2003) revealed the unexpected result that higher dividend payout ratios at the market level correspond to higher future earnings growth in the United States. Their paper was in response to several studies, notably Ibbotson and Penn (2003), which found cause for optimism about long-run equity returns in the US market after the sharp decline in stock prices in the year 2000, in the historic low dividend payout ratios of US companies. Applying an intertemporal extension of the Miller and Modigliani (1961) dividend irrelevance theorem, a lower dividend payout ratio was assumed to be associated with higher future growth and thus higher future equity returns. This was because as a firm pays out a lower proportion of its retained earnings as dividends, the firm has greater funds with which to undertake future profitable investment opportunities, resulting in a higher growth rate of earnings. Incorporating 130 years of data and numerous robustness tests, the study by Arnott and Asness (2003), which examined the relationship between the payout ratio and future earnings growth on the S&P 500 Index, came to the opposite conclusion. Numerous subsequent authors have supported this result, with significant implications for equity valuation.

The surprising results by these authors gave rise to several potential explanations. The first and simplest explanation is that as dividends are more stable over time, the positive relationship is driven by mean reversion in earnings. Alternatively, it is suggested that managers may use the payment of an increased dividend to signal their private information about the firm's future cash flows, or dividends may be used to help mitigate the principal agent conflicts arising when firms experience large free cash flows and/or poor investment opportunities. The last two hypotheses fall under information-based models of dividends, which imply that dividend policy is a useful predictor beyond information contained in other variables.

Given the importance of the payout ratio's role in asset pricing and future equity returns, it is of little surprise that this relationship was also tested for in Australia. Parker (2005) the only study to have examined this relationship in Australia, did find a positive relationship between the dividend payout ratio and future earnings growth at the market index level. One major issue with market level studies such as Parker (2005) however, is that as the index is capitalization weighted, the dividend and earnings characteristics of a few large firms making up the majority of the index may dominate the results.

This paper thereby examines the dividend-earnings relationship in Australia at the company level, overcoming the problems inherent in market-index level studies. This provides a clearer picture of the relationship between the dividend payout ratio and future earnings growth. Furthermore, this paper also attempts to explain the causes for this relationship in relation to mean reversion in earnings and the cash flow signaling and free cash flow hypotheses. Understanding the relationship between the dividend payout ratio and the earnings growth for firms in Australia will have important implications for company valuation.

This remainder of this paper is organized as follows. Section 2 offers a review of prior literature; Section 3 provides an overview of the data and methodology. In Section 4 we present our results. Concluding comments are provided in Section 5.

LITERATURE REVIEW

As pointed out by Gwilym et al. (2006), though the dividend payout ratio has been the subject of extensive theoretical modeling by corporate finance researchers, the payout ratio has been neglected in the asset pricing and predictability literature. Arnott and Asness (2003) addressed this oversight, finding a positive relationship between the payout ratio and ten-year future earnings growth over the period 1871 to 2001. In testing that mean reversion in earnings was responsible for this relationship, a negative coefficient on a lagged earnings growth variable was found, though this did not subsume the power of the payout ratio. Supporting the free cash flow hypothesis, a strong negative correlation between the market wide payout ratio and the level of gross domestic private investment to GDP was found.

Examining this relationship in ten countries outside the United States, Gwilym et al. (2006) reported that the international evidence broadly supported the findings of Arnott and Asness (2003). Vivian (2006) provided further support to the results of Arnott and Asness (2003), reporting a strong positive association between the payout ratio and earnings growth across twenty industries in the UK. Both mean reversion in earnings and the cash flow signaling hypothesis failed to explain this relationship, with the lagged earnings growth variable unable to subsume the power of the payout ratio, while the lagged dividend growth variable was insignificant in explaining future earnings growth.

Ping and Ruland (2006) tested the dividend-earnings relationship at the firm level, given that the results at the market level may potentially be dominated by a few large firms. Their results also supported Arnott and Asness (2003), while holding under numerous specification tests. The coefficient on the payout ratio also remained positive and significant under different tests of the mean reversion in earnings hypothesis. Last, an interactive variable of the payout ratio and market to book ratio was negative and significant, indicating that when growth opportunities are limited, the relationship between the payout ratio and future earnings growth is stronger, supporting the free cash flow hypothesis.

Finally, Parker (2005) found there to be a positive relationship between the payout ratio and earnings growth across the United States, Canada and Australia, with the relationship weakest in Australia over the period 1956 to 2005. Despite the relationship between the dividend payout ratio and future earnings growth being weakest in Australia, a rolling regression of 10-year future earnings growth on the current monthly payout ratio found that the R-squared and t-statistics of all 237 monthly regressions conducted for the ASX market index were significant.

DATA AND METHODOLOGY

The data used in this study was obtained from Huntley's Financial Analysis Database. The sample includes both listed and delisted firms over the period 1989 to 2008 on the Australian Stock Exchange. The data set includes the firm's net profit after tax, ordinary dividends paid, market value of equity, short and long term debt, and total assets. Financial firms and utility companies are excluded from the sample given the different characteristics of these firms relative to others on the ASX. Following Fama and French (2002) and Ping and Ruland (2006), firms with less than $500,000 in total assets and $250000 in its book value of equity are excluded from the sample. The sample size is also necessarily reduced as it only includes firm years with positive earnings. As the specified regressions requires data for both past and future earnings growth rates, the sample size is thus a decreasing function of the growth period employed. The sample consists of 682 firms and 3629 observations when examining one year future earnings growth, 316 companies and 1425 observations when examining three years of future earnings growth and 138 companies and 533 observations for five year earnings growth.

Table 2 reports the descriptive statistics of the sample. In regards to earnings growth, the median annualised earnings growth of Australian firms ranges from 11.0% for one year earnings growth to 7.0% for five year earnings growth. These growth rates are marginally lower than reported by Ping and Ruland (2006) for US companies at 12.6% and 9.7% respectively. The median payout ratio in Australia is however higher than the median for US firms, at 40.7% relative to 33.2% in the United States (Ping and Ruland, 2006). Looking at the other explanatory variables, the medians for return on assets and earnings yield are 6.14% and 6.99% respectively. This is also somewhat lower than reported by Ping and Ruland (2006) with a median return on assets and earnings yield of 6.7% and 8.7%. Australian firms are significantly less geared than their US counterparts however, with a median leverage ratio of 17.5% in Australia comparably smaller than 46.8% in America.

Table 1: Derived Variable Definition

Symbol	Definition
Future Earnings Growth	$r = \frac{EARN_{t+1}}{EARN_t} - 1$ $EG = \sqrt[n]{(1+r_1) + \ldots + (1+r_n)}$
Dividend Payout Ratio	$Payout = \frac{DIV_0}{EARN_0}$
Firm Size	$Firm\ Size = \ln[MVE_0]$
Leverage	$LEV_0 = \frac{BVD_0}{TA_0}$
Return on Assets	$ROA = \frac{EARN_0}{TA_0}$
E/P Ratio	$\frac{E}{P} = \frac{EARN_0}{MVE_0}$
Lagged Earnings Growth	$r = \frac{EARN_t}{EARN_{t-1}} - 1$ $LEG = \sqrt[n]{(1+r_1) + \ldots + (1+r_n)}$

This table provides summary definitions of the variables employed in the regression analysis.

In noting that the existence of a positive relationship between the dividend payout ratio and earnings growth at the company level has implications for company valuation, it is important to determine if the results of Parker (2005) using the ASX Composite Index also holds for individual firms. This paper thereby employs a company level analysis approach in testing the relationship between the payout ratio and future earnings growth similar in nature to that of Ping and Ruland (2006), who confirmed that the results of Arnott and Asness (2003) can be extended to individual companies. Following Ping and Ruland (2006), the relationship between the dividend payout ratio and future earnings growth is tested using the following multivariate regression:

$$EG_{it1,3,5} = \alpha + \beta_1 Payout_{it} + \beta_2 Size_{it} + \beta_3 ROA_{it} + \beta_4 E/P_{it} + \beta_5 LEV_{it} + \beta_6 PEG_{it-1,3,5} + e_{it} \qquad (1)$$

where

$EG_{it_{1,3,5}}$ = Earnings growth, measured as compounded annual earnings over one, three and five years. Earnings are first divided by the total shares outstanding to obtain earnings per share. This removes the effect of capitalization changes on earnings growth. The geometric return is calculated by adding 1 to each periodic return (r), multiplying these values and taking the nth root of this product.

$Payout_{it}$ = The dividend payout ratio, calculated as year zero annual reported dividends (DIV_0) divided by year zero annual reported earnings ($EARN_0$).

$Size_{it}$ = Firm size. In accordance with other studies such as Fama and French (2002), Chan, Karceski and Lakonishok (2003) and Ping and Ruland (2006), firm size is calculated as the natural logarithm (*ln*) of the firm's market value of equity (MVE) at the end of year zero. The market value of equity is calculated as the end of year share price multiplied by the number of outstanding shares.

LEV_{it} = Leverage. This study follows Ping and Ruland (2006) and calculates leverage (LEV_0) as a firm's book value of debt (BVD_0) divided by the firm's total assets (TA_0) at the end of year zero.

ROA_{it} = Return on assets, calculated as the end of year zero earnings ($EARN_0$) divided by end of year zero total assets (TA_0).

E/P_{it} = The earnings yield, calculated as the firms annual earnings for year zero ($EARN_0$) divided by the firm's end of year market value of equity (MVE_0).

$PEG_{it_{-1,3,5}}$ = Lagged Earnings Growth Past earnings growth is measured as compounded annual earnings from time $-t$ to time 0. The growth rates will be calculated over one, three and five years to match the growth rate in future earnings.

The regression model employed follows the methodology of Ping and Ruland (2006), used for comparative purposes for the Australian market. An important difference between the study of Ping and Ruland (2006) and Arnott and Asness (2003), and subsequently this study and that of Parker (2005), is the time horizon employed. Examining future earnings growth for t+1, 3 and 5 years differs to that of Parker (2003) who investigated the relationship between the payout ratio and 10-year future earnings growth. There are two reasons for this difference. First, the use of ten years in future earnings growth requires an increased number of observations. When also including a lagged growth earnings variable of ten years, this necessitates twenty one company year observations, a requirement that will severely reduce the sample size of the study. Second, from an investment perspective, it can be argued that investors are likely to be interested in short and intermediate growth horizons that can be predicted with more certainty.

Table 2: Descriptive Statistics of Firm Variables

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
EG(0,1)	0.5699	0.1102	25.007	-0.9537	2.103	5.626	44.189
EG(0,3)	0.1355	0.0814	2.385	-0.6176	0.3807	1.845	9.384
EG(0,5)	0.0952	0.0695	2.541	-0.6135	0.2751	2.405	16.349
Payout	0.4113	0.4067	2.101	0	0.4021	0.7982	3.4821
Size	17.467	17.102	26.766	11.835	2.103	0.7331	3.336
ROA	0.0833	0.0614	0.7507	0.0015	0.0813	2.9108	15.698
Leverage	0.1982	0.1747	1.917	0.0005	0.1687	1.029	5.097
E/P	0.0899	0.0699	0.8317	0.0019	0.0869	3.689	22.306
PEG(-1,0)	0.5842	0.1149	25.007	-0.9537	2.112	5.535	43.042
PEG(-3,0)	0.137	0.0791	2.416	-0.6186	0.3879	1.9108	9.626
PEG(-5,0)	0.0928	0.0676	2.749	-0.6135	0.2768	2.718	19.944

Our sample consists of 682 firms and 3629 observations when examining one year future earnings growth, 316 companies and 1425 observations when examining three years of future earnings growth and 138 companies and 533 observations for five year earnings growth. This table shows several sample characteristics of the variables employed, being future earnings growth for one, three and five years, the dividend payout ratio, firm size, return on assets, earnings yield, leverage and past earnings growth for one and three years.

The primary variable in the multivariate regression is the dividend payout ratio. Under the assumptions of Modigliani and Miller (1961), it is expected that there is an inverse relationship between the payout ratio and future earnings growth, suggesting a negative coefficient on the $Payout_{it}$ variable. It is hypothesized however that the coefficient on the $Payout_{it}$ variable will be positive, in line with the recent empirical results of Arnott and Asness (2003), Parker (2005), Vivian (2006), Ping and Ruland (2006) and Gwilym et al. (2006).

In order to overcome the effects of omitted variable bias, other firm variables that are thought to influence a firm's future earnings growth are included as control variables in the multiple regressions. Size is controlled due to the results of Chan, Karceski and Lakonishok (2003) revealing that large firms reported slower growth rates in sales, operating income before depreciation and income before extraordinary items. The managerial lifecycle hypothesis provides a theoretical reason for the difference in growth rates between large and small organizations, a simple explanation of which is provided though Schumpeter's (1934) account of a firm that creates a new innovation, leading to imitation of the innovation by competitors and causing an eventual zero profit to be earned in the market. Considering this, it is hypothesized that the coefficient on the size variable will be negative.

Leverage is controlled for given the argument by Brander and Lewis (1986) that the use of debt makes firms more aggressive within their particular product market. If the firm, by being more aggressive can deter otherwise profitable entry, then prices will be higher and industry output will be kept below what it otherwise would have been (McAndrews and Nakamura 1992), leading to higher profits for the firm. Similar to dividends, debt may also mitigate agency costs by reducing the level of excess cash within the firm or be used as a means of signaling a firm's future cash flows. For these reasons it is hypothesized that the coefficient on the leverage variable will be positive, that is an increase in the leverage of the firm will be associated with greater earnings growth.

Return on assets is controlled for given that when the return on a firm's assets is already high, it would be difficult for the firm to continue to demonstrate strong earnings growth i.e. the firm experiences mean reversion in profitability. This result is empirically supported in the academic literature, including Freeman, Ohlson and Penman (1982) and Fama and French (2000). This is because within a competitive market environment, market competition ensures abnormal profits cannot be maintained, leading to a reduction in earnings growth. Thus, the return on assets variable is expected to be negative.

Following the prior literature on the dividend payout and earnings growth relationship, the earnings yield is also controlled for. If securities are priced efficiently, then there should exist a positive relation between the P/E ratio and future earnings growth. Empirical evidence supports this view, with Allen, Henrietta and Clissold (1998) reporting that in the Australian equities market, firms with the highest earnings yield had average annual growth rates below that of the median growth rate for all stocks. Given this prior empirical literature, it is expected that a higher earnings yield will be associated with lower future earnings growth.

Following Arnott and Asness (2006), potential mean reversion in earnings is controlled for through the inclusion of lagged earnings growth in the regression. The time horizon of the lagged earnings growth variable equates to the time horizon for future earnings growth, i.e. when estimating three-year future earnings growth, the three-year lagged earnings growth variable is employed. The coefficient on past earnings growth is expected to be negative, given the theory of competitive markets implies that firms with high abnormal profits will attract new firms into the industry who will compete these profits away, leading to mean reversion in earnings (Fama and French 2000). Such mean reversion in earnings may also be responsible for the positive relationship between the dividend payout ratio and future earnings growth. Lintners' (1956) research into the dividend payment policies of firms found that managers of firms who pay dividends do try to smooth dividends in relation to earnings over time. Numerous empirical studies also support the findings of Lintner (1956), including Darling (1957), Turnovsky (1967), Fama & Babiak (1968), Baker, Farrelly & Edelman (1985) and DeAngelo, DeAngelo & Skinner (1992). With dividends slow to respond to changes in earnings (i.e. dividends are sticky), temporarily high earnings would be associated with a low dividend payout ratio, resulting in a direct relationship between the dividend payout ratio and earnings growth.

EMPIRICAL RESULTS

Univariate Analysis

In examining the univariate relationship between the dividend payout ratio and future earnings growth, table 3 shows the cross correlation matrix between the payout ratio and past and future earnings growth over one, three and five year periods. The associated *p*-values for each correlation coefficient are in parentheses. The results show that the dividend payout ratio is positively related to future earnings growth over one, three and five years. This relationship is also significant at the one percent level for all growth periods.

The data gives preliminary support for the hypothesis that the positive association between the payout ratio and earnings growth is due to mean reversion in earnings combined with sticky dividends. Mean reversion in earnings is indicated by the negative correlation between past and future earnings growth. This relationship is statistically significant at the one per cent level for prior earnings growth periods at the three and five year growth horizon. The correlation between one year lagged earnings growth and one year future earnings growth is also negative, but significant only at the ten per cent level. This supports the results of Vivian (2006), who found a weak relationship between past and future earnings growth at the one and two year periods. Note also that the dividend payout ratio is negatively correlated to past earnings growth, which is significant at the one and three year growth periods, though not at five years. This indicates that when earnings growth is high, dividends do not keep pace with the growth in earnings, causing the dividend payout ratio to fall. Given that earnings are mean reverting, if past earnings growth is low then both the dividend payout ratio and future earnings growth should be high. This leads to a positive association between the dividend payout ratio and future earnings growth, providing support to the hypothesis that the positive relationship is driven by mean reversion in earnings combined with sticky dividends.

Table 3: Correlation between the Dividend Payout Ratio, Past Earnings Growth and Future Earnings Growth

	Payout	**PEG(-1,0)**	**PEG(-3,0)**	**PEG(-5,0)**	**EG(0,1)**	**EG(0,3)**	**EG(0,5)**
Payout							
PEG(-1,0)	-0.1058						
	(0.0130)**						
PEG(-3,0)	-0.1580	0.1080					
	(0.0002)***	(0.0112)**					
PEG(-5,0)	-0.0592	0.0556	0.5340				
	(0.1653)	(0.1925)	(0.0000)***				
EG(0,1)	0.1397	-0.0801	-0.2458	-0.1831			
	(0.0010)***	(0.0601)*	(0.0000)***	(0.0000)***			
EG(0,3)	0.1424	-0.0114	-0.2723	-0.2050	0.4617		
	(0.0008)***	(0.7903)	(0.0000)***	(0.0000)***	(0.0000)***		
EG(0,5)	0.1202	0.0063	-0.2646	-0.1968	0.2906	0.5570	
	(0.0047)***	(0.8822)	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	

*This table shows the cross correlation matrix between the payout ratio and past and future earnings growth over one, three and five year periods. The correlations exclude some of the firms in the sample due to the inclusion of all the growth rates. The figures not in brackets are the correlation coefficients between the two corresponding variables. The figures underneath in brackets are the associated p-values. ***, *, * indicate significance at the 1, 5, and 10 per cent levels respectively.*

Multivariate Analysis

Before turning to the estimation results for the multiple regression, there are several econometric concerns that need to be addressed. As denoted by the subscripts i and t where i = 1, 2,…, N sections and t = 1, 2,…, T time periods, equation (1) is a panel data regression model. For panel data estimation, there are three different estimation selections, the common constant, fixed effects and random effects models. To determine if the use of fixed effects is preferred over the common constant method, an F-test is employed, with the null-hypothesis that all the constants are homogenous allowing the use of the pooled common constant method. In determining whether to use the random effects over the fixed effects model, the Hausman (1978) test will be used. The results in table 4 indicate that the fixed effects model is the most appropriate.

Table 4 shows the regression results for each of the three earnings growth periods. In estimating the fixed effects model, a feasible GLS specification that allows for the presence of cross-section heteroscedasticity is estimated. This is done by adding cross section weights, where each panel equation is downweighted by an estimate of its cross-section residual standard deviation. Examining the estimated regressions, it can be seen that they are all highly significant at the one percent level, as indicated by the F-statistics. The adjusted R^2 ranges between 0.2956 (one-year EG) and 0.4899 (five-year EG). This indicates that approximately 30 to 50 per cent of the variation in earnings growth over one, three and five year periods can be explained by the estimated models, a result similar to Ping and Ruland (2006).

The explanatory variables in all three regressions generally have the expected sign, while the majority of the variables are significant at the five and one percent significance levels. The payout ratio is positively related to future earnings growth at one, three and five years, with this relationship highly significant at the one percent level. In regards to prior earnings growth, the lagged earnings growth variable is negative for all three periods, indicating that earnings are mean reverting. This supports the findings of Ping and Ruland (2006) who find an insignificant relationship between one year lagged earnings growth and one year future earnings growth, as well as the results of Vivian (2006) who reported the lagged earnings growth variable was insignificant at the one and two year growth horizon.

Table 4: Future Earnings Growth Over One, Three and Five Years as a Function of the Dividend Payout Ratio

	One-Year EG		**Three-year EG**		**Five-Year EG**	
Variable	**Coefficient**	**t-Statistic**	**Coefficient**	**t-Statistic**	**Coefficient**	**t-Statistic**
Intercept	4.183	6.040***	1.075	3.2813***	1.075	2.8927***
Payout	0.5373	7.699***	0.0836	4.380***	0.0517	3.502***
Size	-0.1663	-4.706***	-0.0387	-2.323**	-0.0392	-2.095**
ROA	-4.875	-5.6741***	-2.9069	-7.8134***	-2.0636	-4.7061***
E/P	-5.521	-7.062***	-1.058	-3.197***	-1.358	-4.100***
Leverage	-0.5350	-1.728*	0.0525	0.5423	0.0035	0.0438
PEG	-0.053938	-1.900*	-0.0806	-2.698***	-0.2352	-2.549**
R^2		0.429		0.4936		0.627
Adjusted R^2		0.2956		0.3496		0.4899
F-statistic		3.216***		3.054***		4.572***
Log likelihood		-5384.84		243.03		308.02
DW		2.128		1.594		2.060
F-Test						
F-Statistic		2.304		2.557		2.750
p-value		(0.0000)***		(0.0000)***		(0.0000)***
Huasman Test Chi-square Statistic		215.22		125.56		19.721
p-value		(0.0000)***		(0.0000)***		(0.0031)***

This table shows the regression results of equation: $EG_{it_{1,3,5}} = \alpha + \beta_1 Payout_{it} + \beta_2 Size_{it} + \beta_3 ROA_{it} + \beta_4 E/P_{it} + \beta_5 LEV_{it} + \beta_6 PEG_{it_{-1,3,5}} + e_{it}$ *The results are reported for all future earnings growth periods, specifically one, three and five years. The variables employed include the dividend payout ratio, firm size, return on assets, earnings yield, leverage and past earnings growth. The bottom of the table shows the results of the F-test and Huasman test used to determine the type of panel regression to be employed, i.e. pooled, fixed-effects or random effect model, with the foxed-effects model preferred. The figures in the first column of each growth period are the regression coefficients. The figures in the second column are the associated t-statistics. ***, *, * indicate significance at the 1, 5, and 10 per cent levels respectively.*

The results also show that the return on assets variable is both negative and highly significant for all three growth periods, consistent with the results of Ping and Ruland (2006) as well as Fama and French (2000) who documented that high (low) profitability implies lower (higher) future earnings. The coefficient on the earnings yield has the expected negative sign and is significant at the one percent level for all three growth periods, indicating that securities are priced efficiently as implied by the theoretical valuation framework of Gordon (1962). Finally, the size variable indicates that larger firms have slower earnings growth than smaller firms, while the firm's leverage does not have any impact on a firm's future earnings.

Importantly, the lagged earnings growth variable did not subsume the power of the payout ratio, indicating that mean reversion in earnings is not responsible for the positive relationship between the dividend payout ratio and future earnings growth. In the regressions shown in table 4 however, it has been assumed that earnings growth follows a symmetrical pattern, i.e. if earnings growth increases for one year, then it will decrease in the following year, or if it increases for three years then it will decline for the following three years. Thus, for each estimated regression the growth rate for prior earnings growth was the same as that for future earnings growth. These growth rates need not be symmetrical however. Earnings may increase for one year then decrease for three years, or earnings may increase for five years and then decrease for three years. The positive relationship between the payout ratio and future earnings growth may be a result of mean reversion in earnings, though this does not show in the regression output due to the assumption of symmetrical earnings growth cycles.

To account for this possibility, the regressions in table 4 were repeated in which all lagged earnings growth variables were controlled for. For instance, at the one year growth horizon, the lagged earnings growth variables at three and five years were included in the regression in addition to the one-year lagged earnings growth variable. Table 5 shows the results for this test, with the coefficient on the payout ratio continuing to remain positive for all three growth periods. Furthermore, the coefficient is significant at the one percent level for the one and three year growth horizon and significant at the five percent level for the five-year growth horizon. Even after controlling for the effects of non-uniform earnings growth cycles, the lagged earning growth variables fail to subsume the power of the payout ratio, indicating that mean reversion in earnings cannot explain the positive relationship between the payout ratio and future earnings growth.

Table 5: Future Earnings Growth Over One, Three and Five Years as a Function of the Dividend Payout Ratio with Non-Symmetrical Earnings Growth Cycles

	One-Year EG		**Three-year EG**		**Five-Year EG**	
Variable	**Coefficient**	**t-Statistic**	**Coefficient**	**t-Statistic**	**Coefficient**	**t-Statistic**
Intercept	1.090	0.7334	0.8569	1.8242	0.6043	2.1824**
Payout	0.4440	3.840***	0.1311	4.438***	0.0387	2.184**
Size	-0.0293	-0.4168	-0.0283	-1.225	-0.0175	-1.318
ROA	-1.858	-1.209	-2.245	-4.783***	-1.878	-5.184***
E/P	-4.017	-2.005**	-1.247	-2.700***	-0.7060	-2.185**
Leverage	-0.2698	-0.7785	-0.1286	-1.086	0.0089	0.1158
PEG(-1,0)	-0.0843	-1.827*	-0.0043	-0.3715	-0.0034	-0.4808
PEG(-3,0)	-0.2421	-1.633	-0.0381	-0.8114	-0.1161	-2.916***
PEG(-5,0)	-0.4538	-2.612***	-0.2384	-3.399***	-0.2123	-2.658***
R^2		0.3803		0.5688		0.6270
Adjusted R^2		0.2029		0.4210		0.4861
F-statistic		2.143***		3.849***		4.448***
Log likelihood		-1774.18		233.97		340.99
DW		2.083		1.687		2.080

This table shows the regression results of equation: $EG_{it_{1,3,5}} = \alpha + \beta_1 Payout_{it} + \beta_2 Size_{it} + \beta_3 ROA_{it} + \beta_4 E/P_{it} + \beta_5 LEV_{it} + \beta_6 PEG_{it_{-1,3,5}} + e_{it}$ *which incorporates all the lagged earnings growth variables into the regression. This is to control for the possibility of non-symmetrical earnings growth cycles. The results are reported for all future earnings growth periods, specifically one, three and five years. The variables employed include earnings growth, the dividend payout ratio, firm size, return on assets, earnings yield, leverage and past earnings growth. The figures in the first column of each growth period are the regression coefficients. The figures in the second column are the associated t-statistics. ***, *, * indicate significance at the 1, 5, and 10 per cent levels respectively.*

The preceding results show there is a positive relationship between the payout ratio and future earnings growth, which mean reversion in earnings cannot account for. It could be argued that a specific time period/s in the sample may be responsible for the results. Over the period 1989 to 2008, three economic downturns occurred, including the recession of 1990/1991, the slowdown in 2000 as a result of the housing slump, and the impact of the global financial crisis beginning in 2007. These particular periods may have caused the results to show a positive relationship between the payout ratio and future earnings growth.

For instance, Blackwell, Marr and Spivey (1990) revealed that plant closings are a result of declines in profitability, while Lang, Poulson and Stulz (1995) found that a firm undertaking assets sales is motivated to do so as a result of financial distress. Nohel and Tarhan (1997) found that asset sales were positively related to a firm's future operating performance, due to the firm selling off poorly performing assets and streamlining operations to become more efficient. Asset sales increase in time of economic downturns as more firms enter into a period of financial distress. Thus it is possible that if the cash obtained from these asset sales are distributed to investors through the form of dividends, higher dividend payout ratios occurring in these periods may correlate with higher future earnings growth.

Testing the impact of these time periods on the economic performance of the firm are problematic however, given the length of the time period under examination consists of 20 annual observations from 1989 to 2008. For instance, under the three year growth horizon, if the sample is split into three 7-year time periods to account for the need to include observations for both past and future earnings growth, an economic downturn occurs in each sub-period, making it impossible to remove the effect of these downturns from the sample.

The previous tests show that the dividend payout ratio is positively related to future earnings growth and that this cannot be explained by mean reversion in earnings combined with sticky dividends. As discussed by Arnott and Ansess (2003), two other main theories used to explain this relationship are the cash flow signaling and free cash flow hypotheses. The cash flow signaling hypothesis posits that because of information asymmetry between managers and shareholders, dividends mitigate information asymmetry by signaling to investors the firm's expected future cash flows. A higher dividend payment signals to investors managerial confidence in meeting this cost through higher earnings in the future. The payment of dividends are regarded as a costly signal (a necessary condition to prevent mimicking) for a number of reasons, including the greater probability of increased costs in issuing new securities (Bhattacharya 1979), forgone investment opportunities in profitable projects (Miller and Rock 1985), and the higher taxes paid on dividends relative to capital gains (John and William 1985, Bernheim 1991).

Following the approach of Vivian (2006) to test the cash flow signaling hypothesis, future earnings growth at one, three and five years were regressed on the rate of change in dividends at period *t*.

$$EG_{it_{1,3,5}} = \alpha + \beta_1 \Delta Div_{t_{-1}} + e_{it} \qquad (2)$$

where $EG_{it_{1,3,5}}$ is the compounded growth in annual earnings for time t to time $t+1$, time $t+3$ and time $t+5$ and $\Delta Div_{t_{-1}}$ is the change in dividends over time $t-1$ to time t. If managers do signal to investors through increase dividend payments, the coefficient on $\Delta Div_{t_{-1}}$ should be positive and statistically significant, i.e. an increase in a firm's dividend payment is associated with higher earnings in the future.

The results contained in Table 6 reveal that the coefficient on the dividend change rate is negative for all three growth periods, implying an increase in the growth rate of dividend payments leads to a reduction in future earnings growth. Furthermore, the dividend change rate coefficient is significant at the one percent level for three and five years, while it is significant at the ten percent level at the one year growth horizon. This is opposite to what was expected under the signaling hypothesis, in which managers increased dividend payments in expectation of higher future earnings growth.

Table 6: Future Earnings Growth over One, Three and Five Years as a Function of Dividend Growth

	One-Year EG		Three-year EG		Five-Year EG	
Variable	**Coefficient**	**t-Statistic**	**Coefficient**	**t-Statistic**	**Coefficient**	**t-Statistic**
Intercept	0.3560	9.386***	0.1050	15.119***	0.0781	14.158***
DG(-1,0)	-0.1167	-1.804*	-0.0512	-4.991***	-0.0309	-3.857***
R^2		0.3885		0.2756		0.3723
Adjusted R^2		0.2491		0.1105		0.2080
F-statistic		2.788***		1.669***		2.266***
Log likelihood		-3529.02		-148.52		485.51
DW		2.696		1.692		1.772

This table shows the regression results of the equation: $EG_{it_{1,3,5}} = \alpha + \beta_1 \Delta Div_{t_{-1}} + e_{it}$ *.The results are reported for all future earnings growth periods, specifically one, three and five years. The variables employed include earnings growth the rate of change in dividends. The figures in the first column of each growth period are the regression coefficients. The figures in the second column are the associated t-statistics. ***, *, * indicate significance at the 1, 5, and 10 per cent levels respectively.*

Nissim and Ziv (2001) criticize this model, given that the variable $\Delta Div_{t_{-1}}$ is positively correlated with current profitability. As profitability is mean reverting (see Fama and French 2000), the expected change in earnings is likely to be negatively correlated with the change in dividends, leading to a bias against the hypothesis that dividends have information content. To overcome this issue, equation (2) can be augmented with two explanatory variables to capture mean reversion in earnings, namely return on assets and lagged earnings growth:

$$EG_{it_{1,3,5}} = \alpha + \beta_1 \Delta Div_{t_{-1}} + ROA_{it} + LEG_{it_{-1,-3,-5}} e_{it} \quad (3)$$

Table 7 shows under the re-estimated model, the coefficient on the dividend change rate changed substantially. Although the coefficient is still negative, it is now insignificant for all three growth horizons. That the coefficients on the variables ROA and PEG are negative and significant imply that the significance of the rate of dividend change announcement was a result of omitted variable bias in the model, not due to the effect of dividend signaling on future earnings growth. The insignificance of the rate of dividend change coefficient therefore suggests that the cash flow signaling hypothesis fails to explain the positive relationship between the payout ratio and future earnings growth.

Although the cash flow signaling hypothesis could not explain the payout-earnings growth relationship, both the results of Arnott and Asness (2003) and Ping and Ruland (2006) suggest that this relationship can be explained by the free cash flow hypothesis. The free cash flow hypothesis argues that firms with large free cash flows and poor investment opportunities face greater principal-agent conflicts between shareholders and managers. This is because with an excess of cash, the manager in maximizing his/her own utility, has an incentive to use the funds for perquisite consumption or to engage in empire building, either for entrenchment purposes or for increasing managerial compensation (Murphy 1985). This can lead to sizeable agency costs, as the managers' decision to invest the excess funds below the firms cost of capital or on organizational inefficiencies will lead to a decrease in the value of the firm. As noted by Vivian (2006), the opportunities to engage in empire building are more apparent when earnings are high, and thus when the payout ratio is low.

Table 7: Future Earnings Growth Over One, Three and Five Years as a Function of the Dividend Growth, Past Earnings Growth and Return on Assets

	One-Year EG		Three-year EG		Five-Year EG	
Variable	**Coefficient**	**t-Statistic**	**Coefficient**	**t-Statistic**	**Coefficient**	**t-Statistic**
Intercept	0.9039	13.149***	0.3305	8.778***	0.3016	11.0304***
DG(-1,0)	-0.0018	-0.0480	-0.0197	-1.8708	-0.0045	-0.5012
PEG	-0.1727	-2.790***	-0.1573	-4.086***	-0.291	-4.076***
ROA	-7.559	-8.551***	-2.882	-5.790***	-2.716	-7.166***
R^2		0.305		0.415		0.642
Adjusted R^2		0.1509		0.2525		0.5097
F-statistic		1.976***		2.551***		4.852***
Log likelihood		-4025.86		142.57		371.98
DW		2.372		1.806		1.818

This table shows the regression results of the equation: $EG_{it_{1,3,5}} = \alpha + \beta_1 \Delta Div_{t_{-1}} + ROA_{it} + LEG_{it_{-1,-3,-5}} e_{it}$ *. The results are reported for all future earnings growth periods, specifically one, three and five years. The variables employed include earnings growth the rate of change in dividends, prior earnings growth and return on assets. Prior earnings growth and return on assets are included as control variables to overcome potential omitted variable bias. The figures in the first column of each growth period are the regression coefficients. The figures in the second column are the associated t-statistics. ***, *, * indicate significance at the 1, 5, and 10 per cent levels respectively.*

Lang and Litzenberger (1989) tested the free cash flow hypothesis by examining the observed reaction to dividend announcements for firms with a Tobins' q above and below 1. Tobins' q is used as a measure of a firm's investment opportunities, with a Tonin's q below 1 indicating that the firm has poor investment opportunities and is therefore more susceptible to overinvesting. Ping and Ruland (2006) employ the ratio of the company's market value of equity and book value of debt to the book value of its assets (denoted as V/A) as a rough proxy for Tobins' q. A high V/A is an indication of better investment opportunities and therefore lower free cash flow problems. If a higher dividend payout increases future earnings through its associated reduction in agency costs, this effect should be greater for firms with low future investment opportunities. Consequently, equation (1) is changed to:

$$EG_{it1,3,5} = \alpha + \beta_1 Payout_{it} + \beta_2 Size_{it} + \beta_3 ROA_{it} + \beta_4 E/P_{it} + \beta_5 LEV_{it} + \beta_6 Payout_{it}\ x\ V/A + e_{it} \quad (4)$$

where $Payout_{it} \times V/A_{it}$ is a multiplicative variable between the dividend payout ratio and the ratio of the market value of equity and book value of debt to the book value of assets and the other variables are the same as previously specified. A negative and significant coefficient on the $Payout_{it} \times V/A_{it}$ variable would provide support to the free cash flow hypothesis, as it indicates that the effect of the dividend payout ratio is more prominent for low-growth firms.

Table 8 shows that the multiplicative variable VA*Payout is highly insignificant for all three growth periods. This is against what is expected under the free cash flow hypothesis and differs to the results of Ping and Rulland (2006) who find the coefficient on VA*Payout to be negative and significant for all three growth horizons. An argument can be made however that the results presented in table 8 are not necessarily dismissive of the free cash flow hypothesis. Given that the variable VA does not seem to influence earnings growth except at the one year growth horizon, the variable VA*Payout therefore is not going to be significant either. On the other hand, the free cash flow hypothesis rests on the assumption that firms with excess cash and low investment opportunities will have higher agency costs and hence low future earnings growth, and that the reduction in these agency costs through mechanisms such as dividend payments will subsequently improve the firm's earnings growth. The fact that the variable VA, to the extent that it reflects a firms future investment opportunities, fails to adequately explain a firms future earnings growth, suggests that firms with low future investment opportunities do not have higher agency costs, a refutation of the free cash flow hypothesis. Furthermore, even at the one year growth horizon, when the variable VA was positive and significant, the variable VA*Payout was neither negative nor significant as would be expected. Therefore, it can be concluded that the free cash flow hypothesis is unlikely to explain the positive relationship between the payout ratio and future earnings growth.

Table 8: Future Earnings Growth Over One, Three and Five Years as a Function of the Dividend Payout Ratio with a Proxy for Growth Opportunities

	One-Year EG		Three-year EG		Five-Year EG	
Variable	**Coefficient**	**t-Statistic**	**Coefficient**	**t-Statistic**	**Coefficient**	**t-Statistic**
Intercept	4.694	6.749***	1.054	3.211***	0.9613	1.992
Payout	0.5283	5.141***	0.0571	2.182**	0.0550	2.285**
Size	-0.2007	-5.624***	-0.0366	-2.180**	-0.0327	-1.358
ROA	-6.3325	-6.214***	-2.860	-6.647***	-1.735	-3.736***
E/P	-4.6283	-5.690***	-1.0923	-3.0823***	-1.551	-3.522***
Leverage	-0.6437	-2.059**	0.0532	0.5436	0.0250	0.2641
PEG	-0.0530	-1.895*	-0.0808	-2.694***	-0.2364	-3.493***
V/A*Payout	0.0108	0.1813	0.0275	1.483	-0.0020	-0.2545
V/A	0.1446	2.690***	-0.0211	-1.181	-0.0185	-1.380
R^2		0.4325		0.5688		0.6292
Adjusted R^2		0.2995		0.4210		0.4902
F-statistic		2.143		3.848		4.528
Log likelihood		-5373.56		233.97		309.59
DW		2.083		1.687		2.069

This table reports the results of $EG_{it_{1,3,5}} = \alpha + \beta_1 Payout_{it} + \beta_2 Size_{it} + \beta_3 ROA_{it} + \beta_4 E/P_{it} + \beta_5 LEV_{it} + \beta_6 PEG_{it_{-1,3,5}} + \beta_7 Payout_{it} \times V/A_{it} + e_{it}$. *The results are reported for all future earnings growth periods, specifically one, three and five years. The variables employed include the dividend payout ratio, firm size, return on assets, earnings yield, leverage, past earnings growth and a multiplicative variable of the ratio of the firm's market value of equity and book value of debt to the book value of assets and the payout ratio. The multiplicative variable is used to indicate the impact of the payout ratio on associated agency costs of the firm. The figures in the first column of each growth period are the regression coefficients. The figures in the second column are the associated t-statistics. ***, *, * indicate significance at the 1, 5, and 10 per cent levels respectively.*

CONCLUSION

Parker (2005) found that at the market-index level, the payout ratio is positively associated with future earnings growth in Australia. These results can be problematic however, as the dividend and earnings characteristics of a few large firms may dominate these results. We have therefore extended this analysis to the firm level, which supports the findings of Parker (2005), indicating that a firm in Australia increasing its dividend payout ratio will experience higher future earnings growth. Examining a sample of companies over 1989 to 2008, this relationship was found both under univariate analysis, with the correlations between the payout ratio and earnings growth at the one, three and five year growth horizons all strongly positive, and multivariate regression analysis, with the coefficients on the payout ratio in all regressions being positive and highly significant. This relationship also held under tests of mean reversion in earnings, indicating that the dividend-earnings relationship cannot be explained by this hypothesis. Tests of the cash flow signaling and free cash flow hypotheses also failed to explain this relationship. A limitation of the study however, results from the calculation of the payout ratio, which did not include share repurchases due to a lack of data availability. If data permits, follow up research may examine the impact of both dividends and repurchases on earnings. Following prior studies, this study also assumes that earnings growth follows a linear trend. As pointed out by Fama and French (2000) and Bernatzi et al.

(2005), this may be an incorrect assumption. Incorporating the potential non-linearity of earnings into the dividend-earnings relationship may provide results that are more informative. Finally, the paper was unable to explain why the payout ratio was positively associated with future earnings growth, which may have resulted from incorrect tests of the proposed hypotheses, or by not examining explanations that are more relevant. Overall, the company level analysis complements the research of Parks (2005), with both studies finding a direct relationship between the payout ratio and future earnings growth in contrast to the beliefs of many market observers. This result has important implications for firm valuation.

REFERENCES

Allen, D.E., Lisnawati, H., and Clissold, M. (1998), Predicting Earnings Growth Using E/P Ratios: Australian Evidence. *Australian Journal of Management*, 23, 115-128.

Arnott, R., and Asness, C. (2003), Surprise! Higher Dividends = Higher Earnings Growth. *Financial Analysts Journal*, 59, 70-87.

Baker, H., Farrelly, G., and Edelman, R. (1985), A survey of management views on dividend policy. *Financial Management*, 14, 78–84.

Benartzi, S., Grullon, G., Michaely, R., Thaler, R. (2005), Dividend Changes Do Not Signal Changes in Future Profitability. *The Journal of Business*, 78, 1659-1682.

Bernheim, B., and Wantz, A. (1995), A tax-based test of the dividend signaling hypothesis. *American Economic Review*, 85, 532–551.

Bhattacharya, S. (1979), Imperfect information, dividend policy, and ‘‘the bird in the hand’’ fallacy. *Bell Journal of Economics*, 10, 259–270.

Blackwell, D. W., Marr, M. W., and Spivey, M. F. (1990), Plant closing decisions and the market value of the firm. *Journal of Financial Economics*, 26, 235-249.

Brander, P., and Lewis, T. (1988), Bankrupcy costs and the theory of oligopoly. *Canadian Journal of Economics*, 21, 221-243.

Chan, L., Karceski, J., and Lakonishok, J. (2003), The level and persistence of growth rates. *Journal of Finance*, 58, 643-84.

Darling, P. (1957), The influence of expectations and liquidity on dividend policy. *Journal of Political Economy*, 65, 209–224.

DeAngelo, H., DeAngelo, L., and Skinner, D. (1992), Dividends and losses. *Journal of Finance*, 47, 1837–1863.

Fama, E. F., and Babiak, H. (1968), Dividend policy: an empirical analysis. *Journal of American Statistical Association*, 63, 1132–1161.

Fama, E. F., and French, K. R. (2000), Forecasting Profitability and Earnings. *The Journal of Business*, 73, 161-175.

Freeman, R. N., Ohlson, J. A., and Penman, S. H. (1982), Book rate-of-return and prediction of earnings changes: An empirical investigation. *Journal of Accounting Research*, 20, 639-653.

Gordon, M. J. (1962), *The Investment Financing and Valuation of the Corporation*. Homewood, IL: Richard D. Irwin.

Gwilym, O., Seaton, J., Suddason, K., and Thomas, S. (2006), International Evidence on the Payout Ratio, Earnings, Dividends, and Returns. *Financial Analysts Journal*, 62, 36-53.

Hausman, J. A. (1978), Specification Tests in Econometrics. *Econometrica*, 46, 1251-1271.

Ibbotson, R., and Penn, C. (2003), Long-Run Stock Returns: Participating in the Real Economy. *Financial Analysts Journal,* 59, 88-98.

John, K., and Williams, J. (1985), Dividends, dilution, and taxes: a signalling equilibrium. *Journal of Finance*, 40, 1053–1070.

Lang, L. H., and Litzenberger, R. H. (1989), Dividend announcements: cash flow signalling vs. free cash flow hypothesis? *Journal of Financial Economics*, 24, 181–191.

Lang, L.H.P., Poulson, A.B., Stulz, R.M. (1995), Asset sales firm performance and the agency costs of managerial discretion. *Journal of Financial Economics*, 37, 3–37.

Lintner, J., (1956), Distribution of incomes of corporations among dividends, retained earnings, and taxes. *American Economic Review*, 46, 97–113.

McAndrews, J. J., and Nakamura, L. I. (1992), Entry-Deterring Debt. *Journal of Money, Credit and Banking*, 24, 98-110.

Miller, M. H., and Modigliani, F. (1961), Dividend policy, growth, and the valuation of shares. *Journal of Business*, 34, 411–433.

Miller, M. H., and Rock, K. (1985), Dividend policy under asymmetric information. *Journal of Finance*, 40, 1031–1051.

Murphy, K. J. (1985), Corporate Performance and Managerial Remuneration: An Empirical Analysis. *Journal of Accounting and Economics*, 7, 11–42.

Nissim, D and Ziv, A (2001), Dividend Changes and Future Profitability. *Journal of Finance*, 56, 2019–65.

Nohel, T., and Tarhan, V. (1998), Share repurchases and firm performance: New evidence on the agency costs of free cash flow. *Journal of Financial Economics*, 49, 187-222.

Parker, K. C., (2005), Do higher dividends lead to higher earnings growth? Working Paper, Simon Fraser University.

Ping, Z., and Ruland, P. (2006), Dividend Payout and Future Earnings Growth. *Financial Analysts Journal*, 62, 58-69.

Schumpeter, J. A. (1934), *The Theory of Economic Development*. Cambridge: Harvard University Press, New York.

Turnovsky, S. J., (1967), The allocation of corporate profits between dividends and retained earnings. *Review of Economics and Statistics*, 49, 583–589.

Vivian**,** A. (2006), The Payout Ratio, Earnings Growth Returns: UK Industry Evidence. Working Paper, School of Economics, Finance and Business, University of Durham.

ACKNOWLEDGEMENTS

The authors would like to thank the anonymous reviews for their helpful suggestions, lead to a significant improvement in the quality of this paper.

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