

How good are dividend yield and P/E ratios in making asset allocation decisions?

Long-term investors commonly use the price earnings ratio and the dividend yield as asset allocation signals, but they may not be useful in forecasting returns in the short term.

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The price earnings (PE) ratio and the dividend yield (DY) of a firm are arguably two of the measures that investors pay the most attention to when evaluating a firm's stock.

The PE ratio and the DY are regarded by stock analysts and other investment professionals as predictors of the stock's expected future returns, and are seen as popular stock-picking criteria.

These measures are looked at not only at the individual firm level but also at the aggregate level. Professional fund managers use the market's aggregate PE and DY values as key asset allocation signals for changing the investment proportion placed in stocks vis-a-vis other asset classes such as bonds, bills or cash, as these values change with time.

Investors believe that individual stocks as well as the stock market as a whole swing through periods of low or high values from time to time, and become temporarily under- or overpriced during those times.

If a firm's stock price becomes temporarily underpriced, its PE ratio will become low and the DY will become high, and as the underpricing situation rectifies itself subsequently, future returns will rise. The beginning PE ratio will then be positively related, and the DY negatively related, with subsequent

returns. Low (high) PE ratios and high (low) DYs are therefore looked upon as buy (sell) signals by investors.

The present Australian government policy towards retirement planning is designed to encourage more and more people to take responsibility for their own investment plans to provide for their retirement.

These investors look for guidance and search for rules for selecting good investments and making asset allocation decisions. PE ratio rules and DY rules are commonly recommended by financial planners for such purposes and are readily seized upon by investors as reliable decision rules. But how good are these rules, and how effective are they? These questions must be examined carefully before such rules are embraced and put into practice.

TESTING ASSUMPTIONS

The purpose of this paper is to evaluate whether the belief about the predictive ability of the PE and DY is borne out by the recent historical evidence of the Australian stock market at the aggregate level. A test of this belief will have important implications not only as a test of the validity of these rules for asset allocation and stock-picking strategies, but also for the applicability of the market efficiency propositions.

If markets do in fact go through



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temporary price swings, and investors can exploit such market behaviour to forecast returns, then it casts doubts on the idea that stock prices follow a random walk and that future returns are unpredictable. Market efficiency is called into question.

To test these asset allocation rules we examine the returns of the ASX 200 index, denoted as RET, in relation to the PE ratio and the DY yield of the index portfolio. Data on the ASX 200 Index and its PE ratio and DY are available at monthly intervals since the inception of the construction of the index in December 1982 to October 2004 from the Reserve Bank of Australia website. The analysis in this study is based on this data. The summary statistics of the data series are shown in Table 1.

The last column of Table 1 shows a comparison of the mean to standard deviation ratios of the three series. A noticeable point is the very low value in the RET series, compared to those of the DY and PE series, indicating the high variability of the returns compared to the variability of the DY and PE.

METHODOLOGY AND RESULTS

We use a regression model (models 1 and 2, shown below) to test relationships between PE and DY and future returns. The PE ratio and DY at the beginning of a time period is used as the explanatory variable to predict the future index return in two separate regression models.

In interpreting the results from this analysis we demonstrate and explain how these results can lead to a misconception among analysts and financial planners that PE and DY rules are more effective than they truly are. The regression models used are shown as follows:

Model 1

$$RET_{t+1} = \alpha_0 + \beta_0 PE_t + e_t$$

Model 2

$$RET_{t+1} = \alpha_1 + \beta_1 DY_t + e_t$$

The regression model is tested with a number of different return intervals to examine the predictive ability of the

TABLE 1: SUMMARY STATISTICS OF DATA SERIES

Monthly data From January 1983 to October 2004, Number of observations = 263			
Variable	Mean	Std deviation	Mean/Std dev.
RET	0.0112	0.0543	0.206
DY (%)	4.064	0.798	5.092
PE ratio	18.979	7.469	2.541

Note: RET is the continuously compounded index return.

TABLE 2: ESTIMATES OF REGRESSION MODELS BASED ON MONTHLY RETURNS

Monthly returns, Number of observations = 262					
Variable	Coefficient	T-Stat.	Significance	Adj. R ²	DW Stat.
Model 1					
Constant	0.022	2.410	0.016	0.002	2.080
PE	-0.0005	-1.274	0.203		
Model 2					
Constant	-0.022	-1.289	0.198	0.011	2.052
DY	0.008	1.972	0.049		

TABLE 3: ESTIMATES OF REGRESSION MODELS BASED ON QUARTERLY RETURNS

Quarterly returns, Number of observations = 86					
Variable	Coefficient	T-Stat.	Significance	Adj. R ²	DW Stat.
Model 1					
Constant	0.0679	2.49	0.014	0.011	2.238
PE	-0.001	-1.37	0.171		
Model 2					
Constant	-0.056	-1.124	0.263	0.03	2.158
DY	0.022	1.813	0.073		

variables over different future investment horizons. Initially, the return interval is taken as one month, then in the second set of regressions quarterly returns are analysed. The results are given in Tables 2 to 4.

The results of the regression model in Table 2 shows that the coefficient values have the expected sign, negative in the case of PE and positive in the case of DY. The DY variable is significant at 5% level, indicating some predictive ability, but the PE coefficient is not significant.

The overall explanatory power of the model is not strong, with the regression R² quite small. The poor ability of the PE and DY to explain returns is perhaps best explained by the characteristics of the three series seen in Table 1, where the variability of the returns was high compared to the variability of the DY and PE. This is due to the fact that dividends and earnings do not vary nearly as much as

stock prices over time. The ability of the PE and DY to explain return is therefore naturally low.

When the predictive ability of PE and DY to forecast quarterly returns is tested, the results of the regression models, as shown in Table 3, are quite similar to the regressions with monthly returns. Again the PE has no predictive ability while DY has marginal predictive ability.

The belief among finance industry practitioners is that PE ratios and DY are able to predict stock returns at longer horizons, one year or more, rather than at shorter horizons (MacBeth and Emanuel, 1993).

To demonstrate this ability, a common practice in the industry is to calculate moving average or overlapping long-horizon returns. Overlapping returns are often used when long horizons returns are examined. Given the short historical record of the Australian stock market,

only a few observations of non-overlapping can be obtained.

But with overlapping returns the number of observations can be increased several times over. In the case of the ASX 200 index the total span of the available data is less than 23 years, which is insufficient to examine statistical relationships with long-horizon non-overlapping returns. We carry out a regression of overlapping annual returns on the beginning PE and DY values in the following two regressions.

The results of the regression models in Table 4 show much stronger statistical relationships. The DY variable is significant at less than 1% level and the PE is also significant at 10% level.

Such strong statistical relationships taken at face value can naturally lead unwary observers to infer the presence of strong predictive power in the explanatory variables. This is in fact the misconception held among many practitioners in the investment community.

But this apparent relationship is an illusion due to the autocorrelation created by the use of overlapping returns. The use of moving averages of returns can have the same effect. This phenomenon is explained by Hansen and Hodrick (1980). If overlapping

returns of k periods are used in a time series regression, then the regression residuals tend to follow a moving average process of order $k - 1$. In the results of the regression model this is evidenced by the low values of the Durbin Watson (DW) statistics. This results in inconsistent estimates of the standard errors of the regression coefficients and t -statistics that are biased.

In the next set of regression models shown in Table 5, we correct for this bias by applying a correction for the variance covariance matrix of the residuals suggested by Newey and West (1987). The results show the significance of the PE and DW variables in their true light. Neither is significant at conventional levels.

Conclusions

In this paper we address a widely held belief among practitioners in the investment community regarding the ability of the price earnings ratio and the dividend yield to forecast the direction of future stock returns.

To test this, we examine the relationship between the returns of the ASX index at various horizons and its PE ratio and DY at the beginning of the return interval, in a regression framework.

Results showed that the statistical relationships among these variables are weak. We observed that given the low variability of PE and DY values over time compared to returns, the results might not be surprising. We also demonstrate how the measurement of long horizon returns with overlapping intervals can make this relationship appear stronger than it actually is, which may lead casual observers to conclude the presence of a non-existent predictive power in the PE and DY measures.

References

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TABLE 4: ESTIMATES OF REGRESSION MODELS BASED ON ANNUAL RETURNS

Annual returns, Number of observations = 251					
Variable	Coefficient	T-Stat.	Significance	Adj. R ²	DW Stat.
Model 1					
Constant	0.16553	6.261	0.00	0.01	0.25
PE	-0.0022	-1.716	0.087		
Model 2					
Constant	-0.096	-1.976	0.049	0.07	0.23
DY	0.053	4.595	0.000		

TABLE 5: ESTIMATES OF REGRESSION MODELS WITH CORRECTIONS FOR ESTIMATION BIAS

Annual returns, Number of observations = 251					
Variable	Coefficient	T-Stat.	Significance	Adj. R ²	DW Stat.
Model 1					
Constant	0.165	1.549	0.121	0.01	0.252
PE	-0.002	-0.423	0.671		
Model 2					
Constant	-0.096	-0.543	0.586	0.07	0.227
DY	0.053	1.160	0.245		

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