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Dividends, Earnings, the Payout Ratio and Returns: A Century of Evidence from the US and UK

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ABSTRACT

This paper investigates the relationship between real earnings growth, real dividend growth, the dividend payout ratio and real stock returns in the US and UK between 1900-2001. We find a positive relationship in the UK between the payout ratio and subsequent real earnings growth contrary to conventional theory, though consistent with the US evidence presented by Arnott and Asness (2003). By contrast, a negative relationship was observed between the payout ratio and real dividend growth in the UK, although US results offered only limited support for this finding. Overall, we find the payout ratio is negatively related to real returns in the UK.

Introduction

Recent work by Arnott and Asness (2003) has considered the role that the dividend payout ratio of the US equity market plays in forecasting future earnings growth. Contrary to conventional wisdom, they find that growth of real earnings is greatest when the payout ratio is high and slowest when relatively low distributions are made. They argue that, at the time of writing, the combination of a historically high price-earnings ratio and a low payout ratio does not bode well for future returns.

This paper considers whether a similar relationship exists between the dividend payout ratio and real earnings growth in the UK market, especially given the historically different dividend levels and taxation regimes in the two countries[1]. Given Lintner's (1956) finding that the primary determinant of dividends is earnings, the possibility of the payout ratio being a predictor of future real *dividend* growth is also investigated, extending the work of Arnott and Asness (2003).

We find the following:

(i) A *positive* relationship has existed in the UK between real earnings growth and payout ratio. This defies 'conventional theory' and supports the US findings of Arnott and Asness (2003). When the study is extended, a dichotomy is observed between real dividend growth and real earnings growth. Payout ratio is found to have a *negative* relationship with real dividend growth in the UK, supporting the conventional view, but has no strong relationship in the US, possibly due to share repurchases.

(ii) A strong negative relationship is observed in the UK between the payout ratio and real returns. The evidence from the US shows no conclusive proof of a relationship between subsequent real returns and the payout ratio.

(iii) Both dividend yield and earnings yield have strong positive relationships with subsequent returns in the UK for both short and long-term investment horizons. Similar relationships are observed in the US, but only for long-run returns.

Background

There is a considerable body of work based around the effects that dividend yields and price-earnings ratios have had on subsequent returns. Studies such as those by Keim (1985), Christie (1990) and Morgan and Thomas (1998) have described a positive relationship for portfolios of individual firms between dividend yields and returns. Levis (1989), Lakonishok, et al (1993) and Fama and French (1996) have reported the existence of a positive relationship between earnings yield and returns. There is, by contrast, relatively little literature on the proportion of earnings paid out as dividends, or the dividend payout ratio, and its role in asset pricing and forecasting market behaviour. However, in the face of a declining number of firms paying dividends at all in the US, a number of studies[2] have recently focussed on the payout policy of companies.

Miller and Modigliani (1961) introduced their ‘dividend irrelevance’ theorem, which said that the value of a firm was completely independent of the proportion of earnings retained by that firm. Arnott and Asness (2003) applied this logic to the aggregate market using the constant-growth valuation model of Gordon (1962).

$$R = \frac{D}{P} + G \qquad (1)$$

$$R = \frac{D}{E} \cdot \frac{E}{P} + G \qquad (2)$$

The expected return on the market, *R*, is equal to the sum of dividend yield, *D/P*, and the expected constant dividend growth, *G*, (see eq. 1) or alternatively, the product of the payout ratio, *D/E,* and earnings yield, *E/P*, plus the constant growth term, *G* (see eq. 2). Arnott and Asness (2003) consider the effect of a permanent downward shift in the payout ratio. Under Miller and Modigliani's (1961) assumptions, if there has been no change in earnings there can be no change in the value of those earnings and so the earnings yield remains fixed. This implies that for the expected return to remain constant, the shortfall from the lower payout ratio has to be accounted for by an increase in the expected growth in dividends. This reinforces the idea behind the theory that higher levels of retained earnings by firms leads to higher levels of earnings growth. Under the assumption that the payout ratio is held constant, the growth term could equally be the growth rate of earnings as dividends. All of this theory, however, is underpinned by the premise that perfect capital markets exist.

The conventional 'market' view is that higher retained earnings would lead to the exploitation of more positive NPV capital projects and subsequent higher earnings by companies. However, Arnott and Asness (2003) found no evidence to support this view using US data from 1871 to 2001. Indeed the reverse was true with low payout ratios being positively correlated with low subsequent 10-year real earnings growth. They found this was robust to using a 5-year time period as opposed to 10-years, and controlling for mean reversion in earnings, the bond yield-curve slope and the earnings yield. Out of sample tests failed to diminish the effects either. This was a clear contradiction of previous financial theory.

Ibbotson and Chen (2003) find that during the period of 1926-2000, historical dividend growth has underestimated historical earnings growth due to the decline in payout ratio from 47% to 32%. In looking forward, they argue that the estimates for future aggregate returns should not be affected by the payout ratio as this merely influences the means by which investors receive their gains, either through dividends or capital increases. Thus (using the Gordon (1962) model) a low dividend yield has to be offset by higher expected earnings growth. This higher expected growth is also used to explain the high P/E ratio. It is argued that mispricing is not possible within an efficient markets framework and, that as the equity premium is assumed constant over both the period of estimation and the future it cannot be a function of a lower rate of return.

Pursuing a rather different line, Ilmanen (2003) finds a high level of correlation between the earnings yield and a trailing three-year average of inflation. It is suggested that this is surprising since earnings yield is a real variable and higher inflation should be accompanied by higher growth rates. It could be due to inflation impacting real earnings prospects (steady, low, positive inflation was found to the best conditions). Alternatively it creates irrational money illusion that causes stocks to be undervalued (overvalued) when inflation is high (low) or inflation causes the expected real return on bonds to rise and thus the expected real return on stocks to rise to maintain a rational inflation-related risk premium. Ilmanen (2003) argues that low inflation may sustain the currently high P/E ratio in the US market but that if high returns are to be achieved they will probably have to be gained through the difficult process of high real earnings growth given that expansion of the multiple is unlikely from current levels.

All three of these recent studies adopt earnings growth as the relevant growth term in Gordon’s constant growth model as opposed to dividend growth. The argument for choosing this method focuses on the decline in the historic payout ratio in the US. Ibbotson and Chen find that in 2000 this stood at a historical low of 32% compared to an average between 1926-2000 of 59%. They suggest that if dividend growth was used in Gordon’s model this would understate the profitability of US firms.

A recent paper by McManus et al (2004) considers the role of the payout ratio in an asset-pricing context. Using data from the UK market they find that a positive relationship exists between the payout ratio and rolling 10-year returns. Furthermore this effect dominates that of dividend yield although there is no relationship discussed regarding earnings growth.

Data & Methodology

The approach used in this study is very similar to that adopted by Arnott and Asness (2003) so that direct comparisons can be drawn between the US and UK evidence. An index is chosen to represent the aggregate UK market. Using the earnings yield data for the index, a history of the 12-month trailing earnings in index points can be estimated. This series is then divided through by the UK Retail Price Index (RPI) and thus a real earnings series is created for the index. In addition, using the same methodology except substituting dividend yield for earnings yield, a real dividend series is generated. Historical data now exists for the calculation of earnings and dividend growth values.

An important issue with this type of analysis is that the index composition of firms will vary over time. Thus the growth experienced is different from the purchase of a portfolio of stocks that are then held for a long period of time. It is more akin to the growth experienced by an investor who purchases units in a tracker fund. As ‘poor-performing’ stocks are ejected from the index, ‘high-performing’ companies take their place. Furthermore, rebalancing occurs as stocks are acquired and new listings enter the market. Arnott and Asness (2003) suggest that as larger and more profitable firms replace those firms ejected from the index it leads to an increase in the divisor of the index. This divisor also applies to the total earnings of the index and thus the earnings per share is also revised downwards. The upshot of the earnings per share being dragged down is that it fails to keep pace with the growth experienced by the economy as a whole (GDP growth).

The choice of index that is most suitable for this analysis is somewhat more difficult in the UK than in the US. There is a long-run data series in the US for the S&P 500 with prices, returns, dividends and earnings. Unfortunately there is no comparable measure with all of these variables in the UK. A widely quoted broad index is the

FTSE All-Share Index. This market-capitalization weighted index has prices and dividend yields available from April 1962 onwards but there is no earnings data available until 1994. This is primarily due to some financials such as insurers and merchant banks not being required to disclose earnings. However an index starting in April 1962 containing just industrial stocks (including Oil & Gas) has the full complement of prices, dividends and earnings, namely the FT Actuaries 500 Share Index (hereafter called FT 500). This index ran until December 1993 when, as part of a revision of the sector indices in the UK, it ceased. It was replaced though by a 'Non-Financials' index with values matching up exactly with the FT 500. This enables a data period for continuous monthly prices, earnings and dividends to be constructed from April 1962 to December 2001 inclusive using the Indices file from the London Share Price Database (LSPD). The vast proportion of results reported in this study has originated from this data set and is referred to as the 'main sample'.

A second data source is also utilized in this study that offers a long-run series for prices, dividend yields and returns. The Barclays Equity Index (BEI) is part of the Barclays Equity-Gilt Study (EGS) (2003) and is calculated on a value-weighted, annual basis from 1899-2002. Given the lack of indices available in the UK market prior to the 1960s, the BEI has been calculated retrospectively. From 1962 onwards the index uses FTSE All-Share values, between 1935-62 values are taken from the FT-30 Index (for many years the UK benchmark) and pre-1935 values are based on the largest 30 stocks by market capitalization. Whilst this is not ideal as an index series it does provide a method of offering qualified corroboration or contradiction for any conclusions based on dividend yield or dividend growth from the FT 500 data over a longer period of time. All the methodology for calculating the dividend series remains as previously discussed.

UK Results

Earnings Growth and Payout Ratio

The payout ratio throughout this study is defined as the ratio of one-year trailing dividends to one-year trailing earnings (consistent with Arnott and Asness 2003). Between the period of 1962-2001 this has averaged 51.4% with a maximum of 87.3% in July 1966 and a minimum of 32.0% in May 1975. This compared to US figures of an average of 48.9% over the same period, with a maximum of 76.4% in December 1991 and a minimum of 29.9% in September 2000. It is widely accepted that dividends are less variable than earnings and as such it is the latter that causes much of the volatility in the ratio. Periods of dividend controls that were in force in the UK during the 1960s and 1970s[3] may have distorted the payout ratio from what it otherwise would have been since this legislation capped the growth rate of dividends[4]. Dividend controls were also present, in various guises, in the US between August 1971 and April 1974 according to Baker and Wurgler (2003). They found these had a high degree of success in suppressing dividend payouts. Thus the issue of controls is not just UK specific.

Figure 1 presents two plots of real earnings growth against payout ratio, one for ten-year growth and the other for five-year. In both cases there is a positive relationship between payout ratio and earnings growth. Panel A of Table 1 documents the monthly regressions for real earnings growth using payout ratio as the independent variable. Whilst the significance of the payout variable is not as strong as US evidence reported by Arnott and Asness (2003)[5], it is nevertheless consistent in that it exhibits the 'wrong' sign according to traditional theory.

Given that industrial 'growth' stocks are often valued on high multiples of both current and future earnings it seems plausible that when the aggregate market trades on a low earnings yield (i.e. high price-earnings ratio) that high future growth is also likely. Panel B of Table 1 shows the results of using earnings yield as an explanatory variable of future earnings growth. Whilst the sign is 'correct' in as much as the lower the earnings yield the greater the future real earnings growth, the results are modest in their significance. The earnings yield coefficient is insignificant on the 10-year growth regression and the adjusted-R^2 values are lower than both the regressions using the payout ratio.

Panel C of Table 1 shows the effects of using both the payout ratio and earnings yield as explanatory variables for future earnings growth. In the 10-year model the payout ratio retains its significance and the positive coefficient. By contrast the sign on the earnings yield variable changes, thus becoming positive. The 5-year growth model shows both payout ratio and earnings yield retaining their previous signs but both variables also lose their statistical significance. However, the lower adjusted-R^2 value on this regression compared to that of the model with payout ratio alone causes this model to be rejected.

Overall, the evidence presented here supports the previous findings by Arnott and Asness (2003) albeit with lower significance levels. The positive coefficient of payout ratio is not consistent with previous theory that higher retained earnings lead to higher earnings growth. Furthermore, the price the market is prepared to pay for current earnings has only limited ability to predict future real earnings growth.

Dividend Growth and Payout Ratio

In the background to this study it was described how a number of US researchers had focussed on using earnings growth as the growth term in Gordon's model as opposed to dividend growth. This was based on the decline in the payout ratio over time and thus dividend growth would understate the true profitability of the market. The UK market however has not seen the same decline in the payout ratio that the US market has experienced. In April 1962 the payout ratio stood at 51.3% and in December 2001 it was virtually unchanged at 52.1%. Indeed the culture of dividends appears more firmly entrenched in the UK. For example, Benito and Young (2001) find that around three-quarters of all UK firms paid dividends in 1999 whereas Fama and French (2001) find this figure is only around one-fifth in the US. The importance of dividends in the UK encourages the consideration of using dividend growth as the growth term in Gordon's model. There are no comparable results for this in the US studies mentioned earlier.

Figure 2 presents scatter diagrams of subsequent five and ten-year real dividend growth against payout ratio. The contrast with Figure 1 is very marked indeed. There is a clear negative correlation between payout ratio and dividend growth in both the shorter and longer scenarios. Panel A of Table 2 reports the results of the regressions with highly significant negative coefficients in both cases. The explanatory power of these is also much higher than the comparable earnings growth regressions in Table 1.

Panel B of Table 2 tests if dividend yield is able to explain future dividend growth, in the same way that earnings yield and future earnings growth was investigated in Table 1. Both regressions display positive coefficients for dividend yield, the opposite sign compared to when earnings yield was used to explain real earnings growth. The adjusted-R^2 values are relatively low compared to the regressions where payout is the independent variable in Panel A.

When the payout ratio and dividend yield variables are used together the payout ratio maintains its negative coefficient with a high level of statistical significance. The sign changes on the dividend yield variable but is not significant. Overall, payout ratio is again an important variable in explaining real growth; however the differing signs between real dividend and earnings growth is a very interesting outcome. Whilst the earnings growth defied conventional theory, dividend growth very much supported it. Why this should have occurred is indeed very puzzling.

Payout Ratio and Returns

Whilst the notion of explaining future earnings or dividend growth based on payout ratio is in itself interesting there is a commonly held underlying belief that this growth should in someway be linked to returns. If growth in profitability and dividends is unrelated to returns then it is of no concern to investors when making investment decisions and there is little value in attempting to forecast it. Arnott and Asness (2003) demonstrated the positive relationship between earnings growth and payout ratio but it was, quite logically, assumed this growth was positively related to returns. Prior to their study, however, it was also logically assumed that lower payout ratios lead to higher earnings growth. Thus this section considers the relationship that has existed in the UK between payout ratio and subsequent returns.

Unfortunately there is very little total return data for the main sample and thus to construct a returns series requires some assumptions along the lines of those used in calculating the earnings and dividends series. Given that the total earnings (dividends) of the market over the previous year was assumed to be the earnings (dividend) yield multiplied by the index level, the same is assumed for returns purposes. It is also assumed that dividends are reinvested at the end of twelve-month periods for return periods in excess of one year. This is likely to underestimate total returns compared to immediate reinvestment of dividends but given the data available, this is the best means of calculating this type of return and is consistent with the annual returns method suggested by Fama and French (1998).

Thus, in estimating the returns on the index, twelve month returns were initially calculated using the formula below (eq. 3), where R_n is the nominal 12 month return, P_1 and P_2 are the index levels at the start and end of the twelve month period respectively and d_2 is the dividend yield at the end of the period expressed as a decimal. The formula reads as the ratio of, the sum of the final index level and the dividends paid over the year in index points, to the initial index level.

$$R_n = [P_2(1 + d_2) \div P_1] - 1 \qquad (3)$$

The real return for the twelve-month period is then calculated by subtracting the change in inflation over the period from the nominal return. The product of the annual real returns followed by taking the appropriate root gives rise to the long-run returns[6]. Thus the returns are quoted annually compounded with dividends reinvested at the end of every twelve months.

Since 1994 total return series have been available for all of the major indices in the UK. This provides a means of comparing the method used in this study with the standard returns calculated by the index provider (in this case FTSE). Between 1995-2001, using monthly values, the average nominal 12-month return as stated by FTSE is 10.60% on the non-financial index, whilst the average return using Equation 3 is 10.36%. The correlation between the annual returns, calculated on a monthly basis, is 0.998. As all returns calculated on the main sample are on the same basis it seems unlikely that this relatively small difference would in itself generate entirely misleading conclusions.

Table 3 describes the relationship between payout ratio and subsequent returns. There are significant negative coefficients on the payout ratio variable in both the 10-year and the 5-year specifications. The explanatory power of both regressions is good, particularly on the 10-year model. It is concluded that in the UK, higher retained earnings have led to higher real returns during the latter part of the twentieth century.

Dividend Yield, Earnings Yield and Returns

This section explores the impact of dividend yield and earnings yield on real returns. Dividend yield is viewed as being particularly relevant as this appears in the initial version of Gordon's model. Data covering a longer time scale is also now utilized to see if a relationship was in evidence prior to the relatively recent period of 1962-2001, with return periods of 1, 3, 5 and 10 years analysed.

Panel A of Table 4 presents the regression results using monthly data from the main sample. In all four cases real returns are positively and significantly related to dividend yield. As the length of return studied increases so the coefficients of dividend yield become smaller and the values of the constants increase. This is consistent with ten-year real returns being less variable than one-year returns. Panel B provides annual results from the main sample for dividend yield rather than the monthly data used in Panel A. This is to provide a like-for-like comparison with the long-run dataset used next in Table 5. Finally, Panel C, by way of a contrast, presents the same regressions as Panel A but with earnings yield replacing dividend yield. Unlike dividend growth and earnings growth, the signs on the two yield variables are the same and statistically significant. The earnings yield variable has higher explanatory power for long-run returns whilst dividend yield explains more of short-term returns.

Table 5 shows long-run regression results using dividend yield to explain real returns. They are sub-divided into three periods, with a full period from 1900-2001, a similar period to the main sample of 1962-2001 and an out of sample period from

1900-1961. Once more significantly positive relationships pervade the regressions, thus it appears the dividend yield-real return relationship has been in existence for a considerable time. Furthermore, this holds for both the shorter and longer period returns. The relationship between dividend yield and returns is analogous to that found for individual securities by, amongst others, Morgan and Thomas (1998) and Christie (1990).

US Results

Previously in this study the relationship between payout ratio and real earnings growth in the UK has been examined using the method adopted by Arnott and Asness (2003). The findings were similar to their US evidence albeit not as resoundingly conclusive. Using the same approach, additional relationships were found in the UK using these variables along with dividend growth, dividend yield, earnings yield and returns. It therefore seems reasonable to test these additional relationships on the US data obtained from Shiller (2000; updated from aida.econ.yale.edu/~shiller/data.htm). Throughout this section the methodology is the same as used previously, including the method for calculating returns.

Table 6 considers the relationships between real dividend growth and both payout ratio and dividend yield. Four periods are analysed in an effort to provide the best possible comparisons. These are a period the same as the UK main sample (1962-2001), the period covering the entire Barclays EGS study (1900-2001), the out of sample period (1900-1961) and the main period of Arnott and Asness' (2003) tests (1946-2001). Panels A and B show results for payout ratio and subsequent 10 and 5 year real dividend growth which are very different to the UK findings. The negative relationship is only present in five of the eight regressions and is significant in just one case. This is accompanied by low or near-zero explanatory power in virtually all regressions.

The use of dividend yield as a variable in predicting dividend growth fares little better. Again explanatory power is low in all but the most recent 10-year periods, where a significant positive relationship exists. The 5-year regressions offer no discernable pattern and the conclusion is drawn that there is no relationship between payout ratio or dividend yield and dividend growth over this time frame.

Table 7 provides an insight into the usefulness of utilising the payout ratio to explain returns. Panels A and B show regressions with subsequent returns explained by payout ratio. It is noticeable there are differing signs on the payout coefficients between the 10 and 5-year return periods and low explanatory power in both models. These findings are very different to the strong results presented for the UK market. Perhaps the difference reflects the divergence between typical payouts in the UK and US? It is interesting to note that despite the positive relationship found between the payout ratio and earnings growth by Arnott and Asness (2003), that payout ratio has a negative relationship with real returns over subsequent ten-year periods. This relationship is consistent with the UK results, however with no obvious link between payout ratio and dividend growth in the US, it is much harder to explain.

In order to complete the comparison between UK and US evidence it is necessary to review the usefulness of dividend yield and earnings yield in explaining returns in the

US. Table 8 contains results for dividend yield using the same four return periods used earlier, namely 10, 5, 3 and 1 years. In each of the sixteen regressions dividend yield has a positive relationship with returns. It is noted that it is better at explaining the longer return periods than the shorter. This is particularly true of the 1962-2001 period, again possibly due to the changes in dividend payments by firms. It differs from the UK findings where dividend yield was found to have similar explanatory properties for both one and ten-year horizons.

Table 9 reports the same periods as used in Table 8 but with earnings yield as the independent variable. The results are very similar to dividend yield, with all sixteen regressions showing the existence of a positive relationship. Once more the explanatory power is better for the long-run periods than the short. It therefore seems to matter little which US yield measure is chosen in attempting to forecast returns. Also, this only appears suitable for long return horizons.

In attempting to reconcile the differences found between the UK and US markets the obvious major difference is the culture of dividends that was stated at the outset. An additional factor may be the relative composition of the indices chosen. For example, the FTSE-All Share Index, used in the latter part of the Barclays EGS data, is currently heavily weighted in financials, pharmaceuticals and oils. By contrast there is very little weighting in information technology and volume automobile manufacturing. There is no current UK listed comparable with say either Microsoft or Intel, or, General Motors or Ford. Perhaps the industrial differences, and the accompanying different growth rates, could explain the variation in results.

Conclusion

This paper has investigated the role that the payout ratio, dividend yield and earnings yield have in explaining future real returns, real dividend growth and real earnings growth in the UK market, and provided a comparison with the US market. Evidence is found in the UK that a positive relationship exists between real earnings growth and payout ratio, or to put it differently, higher retained earnings are not found to lead to higher earnings growth. The introduction of earnings yield as a variable did not affect the result. This does not support conventional theory but is consistent with findings in the US market by Arnott and Asness (2003). When real dividend growth is substituted for real earnings growth it is discovered that a highly significant negative relationship has existed with payout ratio. Higher retained earnings have lead to higher real growth in subsequent dividends. This is very different from the earnings growth findings and is consistent with conventional theory.

Given the previous findings of studies by, amongst others, Keim (1985), Christie (1990) and Morgan and Thomas (1998), dividend yield was also considered an important variable in explaining returns. Analysis using the main data sample found this to be both significant and positively related to real returns over return horizons of 1, 3, 5 and 10 years. The use of an annual data set covering the entire last century confirmed these findings. Earnings yield was also found to been positively correlated with returns between 1962-2001.

When US data was analysed it was found that unlike the UK evidence, there was no obvious link between payout ratio and real dividend growth. Dividend yield was also found to be insignificant in forecasting future dividend growth. Both dividend yield and earnings yield were found to have some ability to predict returns although this was generally limited to subsequent average 10-year returns.

In conclusion, at the time of writing the dividend yield on the UK FTSE Non-Financials index is 2.99% and the payout ratio is 53%. The former is a considerable amount below the average between 1962-2001 of 4.5% whilst the payout ratio is very close to average. Given the relationships found in this paper it seems unrealistic to expect above average returns whilst these conditions persist. Indeed it would appear that valuations of stocks at current levels are no better than fair-value and probably not even that.

Notes

1. Morgan and Thomas (1998) describe these differences.

2. See Fama and French (2001) and DeAngelo et al (2002).

3. See Hansen and Goudie (1988) for a full description of the dividend controls in the UK between 1966-1979.

4. The evidence as to whether controls did affect the payout ratio is somewhat mixed. Chui et al (1992) suggest the impact on the payout ratio is dependent on the allowable growth rate. A low rate would almost certainly suppress the payout but a rate above the average growth rate may encourage managers to pay higher dividends

to ‘keep up’ with the controls. Overall they find no change in the equilibrium rates of return during dividend controls.

5. See Tables 1 and 3 on pages 74-75 of Arnott and Asness (2003).

6. For the 3-year return the cube root is taken, for the 5-year return the fifth root is taken, etc.

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Table 1. Subsequent Real Earnings Growth as a Function of Payout Ratio and Earnings Yield 1962-2001

A. 10 and 5 year subsequent real earnings growth (SRE) as function of payout ratio (PR)				
	Constant			Adj. R^2
SRE10	-0.016 (-1.54)	0.057 PR (3.13)**		8.5%
SRE5	-0.043 (2.00)*	0.100 PR (2.57)*		5.2%
B. 10 and 5 year subsequent real earnings growth (SRE) as function of earnings yield (EY)				
SRE10	0.018 (2.77)**	-0.052 EY (-1.04)		0.7%
SRE5	0.033 (2.79)**	-0.241 EY (-2.79)**		4.0%
C. 10 and 5 year subsequent real earnings growth (SRE) as function of payout ratio (PR) and earnings yield (EY)				
SRE10	-0.052 (-1.97)*	0.097 PR (3.07)**	0.149 EY (1.14)	11.7%
SRE5	-0.023 (-0.48)	0.077 PR (1.22)	-0.082 EY (-0.61)	5.1%

All t-statistics have been adjusted for overlapping observations using Newey-West (1987) correction
** Significant at the 99% level
*   Significant at the 95% level

Table 2. Subsequent Real Dividend Growth as a Function of Payout Ratio and Dividend Yield 1962-2001				
A. 10 and 5 year subsequent real dividend growth (SRD) as function of payout ratio (PR)				
	Constant			Adj. R^2
SRD10	0.111 (12.12)**	-0.208 PR (-14.59)**		56.8%
SRD5	0.099 (6.30)**	-0.185 PR (-7.14)**		26.5%
B. 10 and 5 year subsequent real dividend growth (SRD) as function of dividend yield (DY)				
SRD10	-0.024 (-1.44)	0.628 DY (1.85)		4.2%
SRD5	-0.017 (-0.88)	0.430 DY (1.24)		1.0%
C. 10 and 5 year subsequent real dividend growth (SRD) as function of payout ratio (PR) and dividend yield (DY)				
SRD10	0.123 (7.95)**	-0.214 PR (-14.97)**	-0.174 DY (-0.80)	57.0%
SRD5	0.123 (4.56)**	-0.199 PR (-7.12)**	-0.369 DY (-1.23)	27.2%
All t-statistics have been adjusted for overlapping observations using Newey-West (1987) correction ** Significant at the 99% level * Significant at the 95% level				

Table 3. Real Returns as a Function of Payout Ratio 1962-2001			
A. 10 and 5 year subsequent real returns (SRR) as function of payout ratio (PR)			
SRR10	0.295 (23.49)**	-0.457 PR (-17.63)**	74.0%
SRR5	0.240 (6.01)**	-0.326 PR (-3.82)**	18.6%
All t-statistics have been adjusted for overlapping observations using Newey-West (1987) correction ** Significant at the 99% level			

Table 4. Subsequent Real Returns as a Function of Dividend Yield 1962-2001			
A. 10, 5, 3 and 1 year real returns (RR) as function of dividend yield (DY) (monthly data)			
	Constant		Adj. R^2
SRR10	-0.071 (-2.66)**	2.800 DY (5.35)**	24.0%
SRR5	-0.105 (-2.47)*	3.717 DY (4.54)**	21.9%
SRR3	-0.158 (3.44)**	4.941 DY (6.18)**	23.7%
SRR1	-0.266 (-3.37)**	7.753 DY (4.58)**	20.1%
B. 10, 5, 3 and 1 year real returns (RR) as function of dividend yield (DY) (annual data)			
ASRR10	-0.066 (-1.53)	2.599 ADY (4.12)**	26.9%
ASRR5	-0.088 (-1.19)	3.279 ADY (2.70)**	22.6%
ASRR3	-0.164 (-2.18)*	4.969 ADY (4.61)**	30.3%
ASRR1	-0.419 (-2.73)**	11.077 ADY (3.88)**	37.3%
C. 10, 5, 3 and 1 year real returns (RR) as function of earnings yield (EY) (monthly data)			
SRR10	-0.054 (-3.06)**	1.120 EY (7.00)**	57.5%
SRR5	-0.028 (-1.08)	0.988 EY (4.83)**	22.9%
SRR3	-0.038 (-1.26)	1.127 EY (5.05)**	17.3%
SRR1	-0.063 (-1.07)	1.579 EY (2.66)**	10.4%
All t-statistics have been adjusted for overlapping observations using Newey-West (1987) correction Prefix of ‘A’ indicates annual data used from main sample ** Significant at the 99% level * Significant at the 95% level			

Table 5. Subsequent Real Returns as a Function of Dividend Yield 1900-2001

A. 10, 5, 3 and 1 year subsequent real returns (SRR) as function of dividend yield (DY) 1900-2001

	Constant		Adj. R^2
BSRR10	-0.047 (1.78)	2.231 BDY (4.87)**	21.3%
BSRR5	-0.114 (-2.30)*	3.721 BDY (3.79)**	28.4%
BSRR3	-0.164 (-3.62)**	4.861 BDY (5.70)**	27.9%
BSRR1	-0.323 (-3.37)**	8.581 BDY (4.44)**	26.0%

B. 10, 5, 3 and 1 year subsequent real returns (SRR) as function of dividend yield (DY) 1962-2001

BSRR10	-0.053 (-1.24)	2.438 BDY (3.66)**	30.0%
BSRR5	-0.065 (-0.93)	2.908 BDY (2.35)*	21.9%
BSRR3	-0.122 (-1.73)	4.168 BDY (3.83)**	27.1%
BSRR1	-0.323 (-2.48)*	8.984 BDY (3.77)**	31.9%

C. 10, 5, 3 and 1 year subsequent real returns (SRR) as function of dividend yield (DY) 1900-1961

BSRR10	-0.022 (-0.61)	1.560 BDY (2.27)*	6.6%
BSRR5	-0.169 (-2.90)**	4.814 BDY (4.33)**	34.3%
BSRR3	-0.219 (-3.20)**	5.952 BDY (4.13)**	28.3%
BSRR1	-0.298 (-2.67)**	7.778 BDY (3.18)**	16.5%

All t-statistics have been adjusted for overlapping observations using Newey-West (1987) correction
Prefix of 'B' indicates source of data is Barclays EGS
** Significant at the 99% level
* Significant at the 95% level

Table 6. US Real Dividend Growth as a Function of Payout Ratio and Dividend Yield 1900-2001

A. US 10 year subsequent real dividend growth (SRD) as function of payout ratio (PR)

		Constant		Adj. R^2
1962-2001	USRD10	0.043 (4.70)**	-0.077 UPR (-4.03)**	13.1%
1900-2001	USRD10	0.022 (2.35)*	-0.021 UPR (-1.29)	1.5%
1900-1961	USRD10	0.022 (1.60)	-0.021 UPR (-1.04)	1.2%
1946-2001	USRD10	0.003 (0.16)	0.023 UPR (0.71)	0.6%

B. US 5 year subsequent real dividend growth (SRD) as function of payout ratio (PR)

1962-2001	USRD5	-0.003 (-0.25)	0.017 UPR (0.70)	0.1%
1900-2001	USRD5	0.011 (0.77)	-0.001 UPR (-0.05)	0.0%
1900-1961	USRD5	0.017 (0.76)	-0.011 UPR (-0.32)	0.0%
1946-2001	USRD5	-0.045 (-2.30)*	0.123 UPR (3.12)**	11.2%

C. US 10 year subsequent real dividend growth (SRD) as function of dividend yield (DY)

1962-2001	USRD10	-0.030 (-4.42)**	0.898 UDY (5.77)**	25.7%
1900-2001	USRD10	0.001 (0.14)	0.171 UDY (1.09)	0.6%
1900-1961	USRD10	-0.000 (-0.03)	0.152 UDY (0.68)	0.2%
1946-2001	USRD10	-0.018 (2.51)*	0.788 UDY (4.83)**	19.3%

D. US 5 year subsequent real dividend growth (SRD) as function of dividend yield (DY)

1962-2001	USRD5	0.004 (0.42)	0.058 UDY (0.27)	-0.0%
1900-2001	USRD5	0.025 (2.39)*	-0.323 UDY (-1.29)	0.9%
1900-1961	USRD5	0.042 (1.97)*	-0.584 UDY (-1.51)	1.7%
1946-2001	USRD5	-0.006 (-0.67)	0.591 UDY (2.77)**	5.1%

All t-statistics have been adjusted for overlapping observations using Newey-West (1987) correction
Prefix of 'U' indicates source of data is US
** Significant at the 99% level
* Significant at the 95% level

Table 7. US Real Returns as a Function of Payout Ratio 1900-2001

A. US 10 year subsequent real returns (SRR) as function of payout ratio (PR)

1962-2001	USRR10	0.211 (4.24)**	-0.300 UPR (-2.86)**	10.5%
1900-2001	USRR10	0.106 (7.15)**	-0.066 UPR (-2.90)**	3.5%
1900-1961	USRR10	0.108 (5.36)**	-0.066 UPR (-2.40)*	4.4%
1946-2001	USRR10	0.139 (3.62)**	-0.116 UPR (-1.53)	1.9%

B. US 5 year subsequent real returns (SRR) as function of payout ratio (PR)

1962-2001	USRR5	0.054 (0.96)	0.031 UPR (0.28)	-0.1%
1900-2001	USRR5	0.048 (1.92)	0.038 UPR (0.95)	0.4%
1900-1961	USRR5	0.036 (1.03)	0.051 UPR (1.04)	0.9%
1946-2001	USRR5	0.067 (1.49)	0.041 UPR (0.49)	0.0%

All t-statistics have been adjusted for overlapping observations using Newey-West (1987) correction
Prefix of 'U' indicates source of data is US
** Significant at the 99% level
* Significant at the 95% level

Table 8. US Real Returns as a Function of Dividend Yield 1900-2001

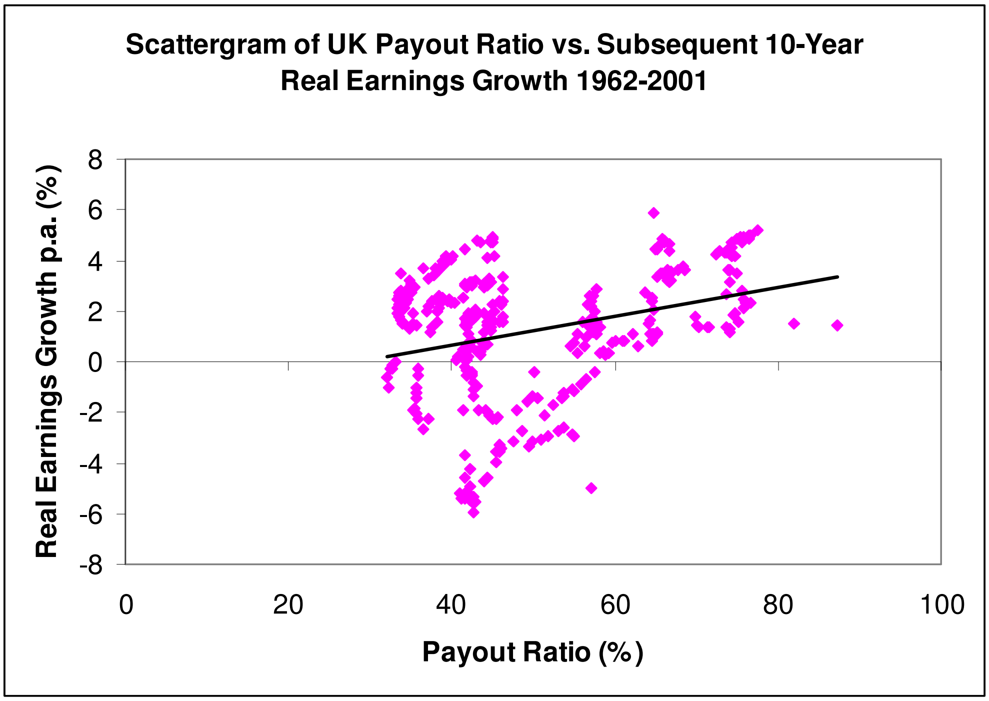
A. US 10 year subsequent real returns (SRR) as function of dividend yield (DY)				
		Constant		Adj. R^2
1962-2001	USRR10	-0.094 (-3.32)**	4.086 UDY (6.81)**	28.6%
1900-2001	USRR10	-0.007 (-0.44)	1.532 UDY (4.69)**	13.8%
1900-1961	USRR10	-0.032 (-1.45)	1.765 UDY (4.22)**	17.6%
1946-2001	USRR10	-0.070 (-3.47)**	3.591 UDY (9.19)**	43.5%
B. US 5 year subsequent real returns (SRR) as function of dividend yield (DY)				
1962-2001	USRR5	0.018 (0.39)	1.421 UDY (1.28)	2.1%
1900-2001	USRR5	-0.013 (-0.61)	1.799 UDY (4.04)**	9.1%
1900-1961	USRR5	-0.106 (4.13)**	3.258 UDY (6.56)**	22.5%
1946-2001	USRR5	-0.033 (-1.14)	3.039 UDY (5.09)**	20.3%
C. US 3 year subsequent real returns (SRR) as function of dividend yield (DY)				
1962-2001	USRR3	0.062 (1.38)	0.291 UDY (0.26)	-0.1%
1900-2001	USRR3	0.005 (0.19)	1.475 UDY (2.59)**	3.9%
1900-1961	USRR3	-0.083 (1.90)	2.926 UDY (3.58)**	10.5%
1946-2001	USRR3	-0.005 (-0.15)	2.420 UDY (3.14)**	9.5%
D. US 1 year subsequent real returns (SRR) as function of dividend yield (DY)				
1962-2001	USRR1	0.010 (0.16)	2.038 UDY (1.15)	1.6%
1900-2001	USRR1	-0.031 (-0.62)	2.602 UDY (2.32)*	3.8%
1900-1961	USRR1	-0.113 (-1.25)	3.926 UDY (2.27)*	5.5%
1946-2001	USRR1	-0.032 (-0.67)	3.219 UDY (2.86)*	6.0%

All t-statistics have been adjusted for overlapping observations using Newey-West (1987) correction
Prefix of 'U' indicates source of data is US
** Significant at the 99% level
* Significant at the 95% level

Table 9. US Real Returns as a Function of Earnings Yield 1900-2001				
A. US 10 year subsequent real returns (SRR) as function of earnings yield (EY)				
		Constant		Adj. R^2
1962-2001	USRR10	-0.036 (-1.69)	1.232 UEY (5.97)**	25.6%
1900-2001	USRR10	-0.029 (2.31)*	1.146 UEY (8.43)**	28.2%
1900-1961	USRR10	-0.034 (-2.23)*	1.145 UEY (6.58)**	31.5%
1946-2001	USRR10	-0.026 (-1.51)	1.266 UEY (7.92)**	34.6%
B. US 5 year subsequent real returns (SRR) as function of earnings yield (EY)				
1962-2001	USRR5	0.043 (1.47)	0.347 UEY (1.06)	1.0%
1900-2001	USRR5	0.011 (0.50)	0.743 UEY (2.86)*	5.4%
1900-1961	USRR5	-0.025 (-0.83)	1.010 UEY (2.95)**	10.4%
1946-2001	USRR5	0.015 (0.63)	0.921 UEY (3.63)**	11.3%
C. US 3 year subsequent real returns (SRR) as function of earnings yield (EY)				
1962-2001	USRR3	0.062 (2.10)*	0.149 UEY (0.45)	-0.0%
1900-2001	USRR3	0.021 (0.75)	0.648 UEY (1.86)	2.5%
1900-1961	USRR3	0.017 (-0.37)	1.051 UEY (1.88)	5.3%
1946-2001	USRR3	0.023 (0.91)	0.844 UEY (2.97)**	6.5%
D. US 1 year subsequent real returns (SRR) as function of earnings yield (EY)				
1962-2001	USRR1	0.045 (1.01)	0.489 UEY (0.83)	0.5%
1900-2001	USRR1	0.031 (0.75)	0.705 UEY (1.38)	0.8%
1900-1961	USRR1	0.033 (0.47)	0.716 UEY (0.91)	0.6%
1946-2001	USRR1	-0.004 (-0.11)	1.237 UEY (2.80)**	4.6%

All t-statistics have been adjusted for overlapping observations using Newey-West (1987) correction
Prefix of 'U' indicates source of data is US
** Significant at the 99% level
* Significant at the 95% level

Figure 1


Scattergram of UK Payout Ratio vs. Subsequent 10-Year Real Earnings Growth 1962-2001
Real Earnings Growth p.a. (%)
8
6
4
2
0
-2
-4
-6
-8
0
20
40
60
80
100
Payout Ratio (%)

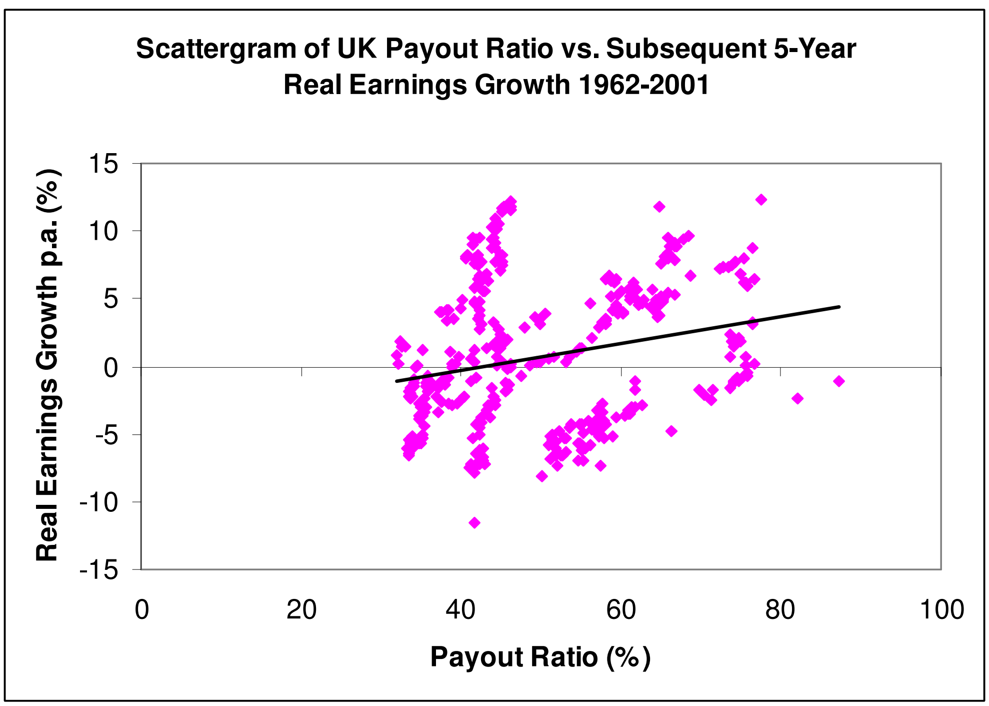
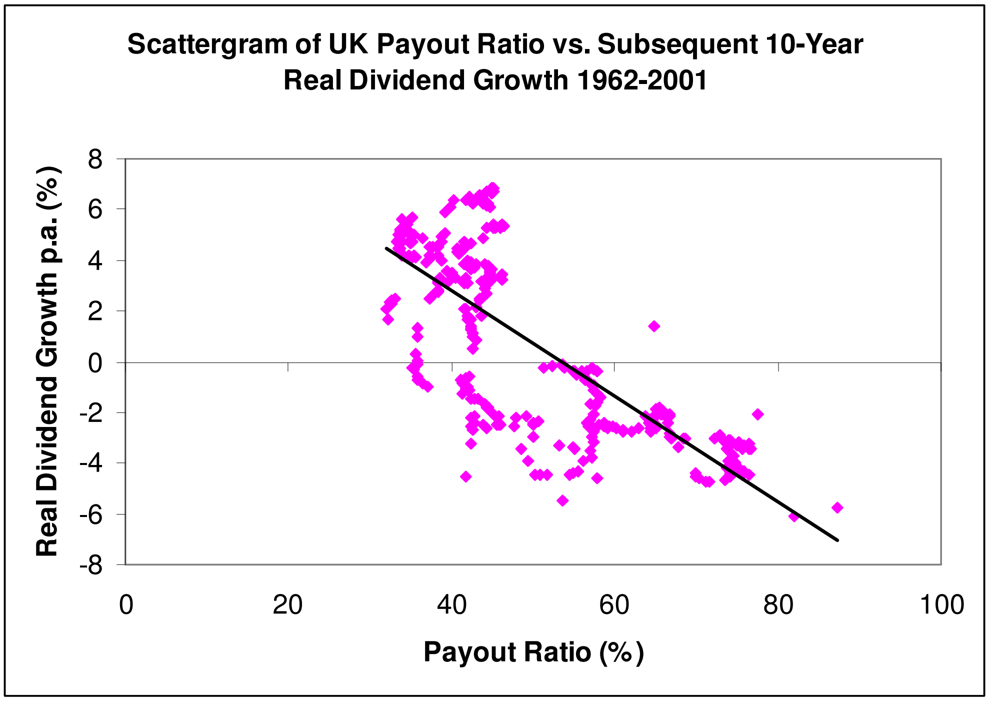
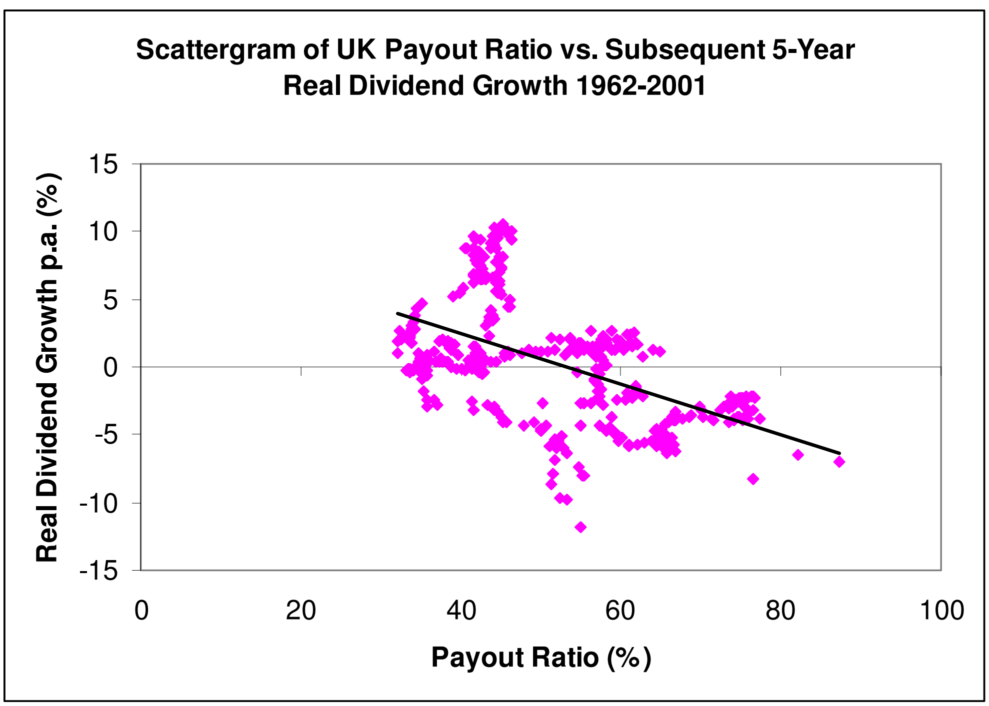

Scattergram of UK Payout Ratio vs. Subsequent 5-Year Real Earnings Growth 1962-2001
Real Earnings Growth p.a. (%)
15
10
5
0
-5
-10
-15
0
20
40
60
80
100
Payout Ratio (%)

Figure 2


Scattergram of UK Payout Ratio vs. Subsequent 10-Year
Real Dividend Growth 1962-2001
Real Dividend Growth p.a. (%)
8
6
4
2
0
-2
-4
-6
-8
0
20
40
60
80
100
Payout Ratio (%)


Scattergram of UK Payout Ratio vs. Subsequent 5-Year
Real Dividend Growth 1962-2001
Real Dividend Growth p.a. (%)
15
10
5
0
-5
-10
-15
0
20
40
60
80
100
Payout Ratio (%)