Catering for Dividends by Stripping Mutual-Fund Portfolios: the Rise and Fall of Split-Capital Investment Trusts

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Abstract

The catering theory (Baker and Wurgler, 2004a, 2004b) argues that there is a time-varying demand for dividends, to which companies respond by initiating or omitting such payments. This paper supports that theory with evidence from "split-capital" closed-end funds in the UK, which flourished in the late 1990s. These funds offered high yields by stripping portfolios into separately-listed capital and dividend shares and then levering-up with 50% debt. Over 1998-2001 the split-capital funds were worth 9% more than conventional funds. Cross-section regressions for 1994-2004 confirm that this was due to a temporary shift in the derived demand for dividends, as small investors sought dividend yields which were not available directly in a rising stockmarket. The paper confirms that dividend yield has an important role in the decisions of some investors.

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It is still an open question why companies bother to pay dividends. At one extreme it is argued that there is nothing to be said on the matter, because company value is not affected (Modigliani and Miller, 1961). Another view is that companies can increase their value by distributing surplus cash rather than re-investing it, if external projects have higher net-present values (Jensen, 1986). Such a distribution, either via dividends or via share repurchases, also reduces the discretion of the managers to waste capital. Over the 1980-2000 period there was a decline in the number of companies paying dividends in the United States, but share repurchases became more important (Fama and French, 2001). Similar changes occurred in the UK (Ferris et al, 2004). However, the total dividend paid-out did not decline in the US and there has recently been an increase in the number of US companies paying dividends again (Julio and Ickenberry, 2004).

The propensity of companies to pay dividends seems to vary over time. Baker and Wurgler (2004a, 2004b), in their "catering theory of dividends", suggest that the time-varying preferences of investors are the main driver of this. The idea is that firms initiate (or withdraw from) payment of dividends when investors have a particularly strong (or weak) demand for such payments. Baker and Wurgler measure the changing demand for dividends over time by the market-to-book ratios of dividend-payers relative to non-dividend-payers; when there is a strong demand for dividends, the market-to-book ratios of companies which pay dividends rise and non-paying companies can act to increase their market values by starting to pay dividends. Baker and Wurgler assemble US evidence which is generally consistent with this theory, but they do not examine in any detail whether it is time-varying risk-aversion or some other mechanism which causes the demand for dividends to change over time. [1]

The aim of this paper is to explain why there was a huge expansion in the UK of one particular kind of mutual fund in the late 1990s. These were closed-end funds with a limited life and a complicated capital structure, known as "split-capital funds" (or split-capital investment trusts). We argue that the new issues were a catering response to the time-varying dividend preferences of investors. In June 1994 there were 54 such funds worth £3.4 bn. By June 2001 there were 112 such funds worth £14.9 bn. Traditional

[1] The catering theory is controversial. Julio and Ickenberry (2004) find its emprical support to be limited, after correcting for firm size. Hoberg and Prabhala (2005) find that idiosyncratic risk is more important in explaining the propensity to pay dividends.

mutual funds, either open-end or closed-end, can only respond to investors' preferences by adjusting the composition of their portfolios; for example the managers may create value funds (with relatively high dividend yields) or growth funds (with low dividend yields). Closed-end funds in the UK are able to tailor their payments more specifically to particular investors, by splitting the liability-side of the balance sheet into several different classes of share. Split-capital funds typically have dividend shares (paying out any yield), capital shares (paying out any residual value at maturity), and zero-dividend preference shares (paying a fixed sum at maturity, which makes them equivalent to zero-coupon debt). In effect, the split-capital funds take equity portfolios and strip them into dividend and capital streams for a pre-determined number of years, with these two streams (and some bond-debt) being separately listed on the stock-exchange. Split-capital funds are a real-world example of the kind of stripping of diversified portfolios which Brennan (1998) has discussed in the context of the S&P500. He argues that there may be considerable benefits from having stripped portfolios, because pension funds can match assets and liabilities more easily and the stripped dividends reveal a term-structure for the discount rate on equity payments.

In examining why investors may prefer one set of payments to another, closed-end funds have two very helpful features. First, shifts in the demand for each kind of fund can be directly observed, as they are reflected in prices moving up and down relative to net-asset values (i.e. as discounts change). Second, there are no signalling or agency effects in the dividend policies of closed-end funds, because the rules require them to pay-through to investors at least 90% of the dividends which they receive from their portfolios; this means that a change in the dividend paid to investors reflects a change in the dividend on the portfolio and not any private information which the manager may have about the fund's prospects or strategy.

The analysis in our paper has two steps. First, we show that the prices of split-capital funds were bid-up over 1998-2001, so that they had significantly higher premia than conventional funds. In this same period the number of new split-capital issues rose hugely and exceeded new issues of conventional funds. Consequently we are able to establish that there was a shift in demand towards split-capital funds and that fund-management companies responded with new issues. Second, we investigate which particular features of the funds were attractive to new investors. This is done by

estimating cross-section regressions (for the universe of funds) in which fund premia are related to fund characteristics in each of the eleven years, 1984 - 2004. The results show that investors were attracted by funds which had high leverage, because that enabled exceptionally high yields to be paid on the dividend-paying shares. Many funds were so keen to raise the dividend yield over 1999-2001 that they borrowed heavily with bank debt (charging only part of the interest, if any, to the dividend shares). They also cross-invested in the high-yield shares of similar funds.

When the stock-market fell after September 2000, the negative consequences of high leverage were not reflected quickly in the prices of split-capital funds. In the first half of 2001 new funds continued to be issued and there was still a premium for dividends, but no longer a premium for leverage. However, by mid-2002 funds with high leverage and high yields were worth less than other funds and sales of split-capital funds to "unsuspecting" investors had become a public scandal, leading to an investigation by the Financial Services Authority. By mid-2003 those funds which had used bank debt to raise the leverage and yield were now trading at large discounts relative to other funds.

Split-capital funds are not the only real-world example of equity stripping; they are quite similar to the primes and scores which existed in the US in the 1980s (Jarrow and O'Hara, 1989). Investors who deposited their shares with Americus Trust would receive a prime component, which paid all of the dividends and any increase in the share value up to a terminal value, and a score component, which benefitted from any capital appreciation above the terminal value. To their surprise, Jarrow and O'Hara found that prime and score components together often exceeded the price of the underlying stock "by a considerable amount" (page 1263). Their explanation was that transactions costs made arbitrage difficult, leading to an enhanced value for the scores. Primes and scores disappeared in the late 1980s because of tax changes. Completely in line with Jarrow and O'Hara we are able to verify, in a different environment, that there is a significant gain of 1-2% from splitting payments on shares into primes and scores. However, this gain is not economically significant when compared with the gain of 9% which was obtained in 1998-2001 by levering-up the portfolio from which the primes and scores made their payments. The key to extra value in our study is generating extra yield with leverage, and not just stripping of shares into prime and score components.

This is the first paper, as far as we know, to test the catering theory of dividends using data on mutual funds. The contributions of the paper can be gathered into four main points. First, there is a time-varying demand for dividends by retail investors, reflected in the values of the levered and stripped funds, to which fund-management companies responded in the late 1990s with new issues. This is strong support for the catering theory of dividends. Second, although one group of investors was seeking extra dividend yield over 1997-2001, leading to a dividend premium for split-capital funds, this did not spill-over into higher prices for ordinary companies which paid dividends. There was a low propensity to pay dividends among ordinary companies at that time. This suggests that "bird-in-hand" preference for dividends may apply to one group of investors while, at the same time, other groups of investors are behaving quite differently. Third, the surge in new issues of split-capital funds in the late 1990s supports the argument of Lee, Shleifer and Thaler (1991) that investors who buy closed-end funds at issue are acting irrationally. In this case, investors were attracted by one salient feature – the dividend yield – and seem to have ignored the risk which was necessary to obtain that yield and which became apparent later when many funds collapsed. Fourth, the simple stripping of equity into primes and scores generates a small amount of extra value, confirming in a different environment the US results from the late 1980s.

The paper is written as follows. In the first section we place this research in the context of previous work and explain the main features of split-capital funds. In section two we discuss the sample to be used and the sources of data. In section three we compare the premia (market-to-book) of split funds with those of a sample of conventional funds over the eleven years, 1994 to 2004. We also examine whether extra value is generated from the simple prime/score split, using time-series data. In section four we report the results of cross-section regressions for each year, which aim to find which particular characteristics (e.g. leverage or dividends) affect premia. In section five we contrast our results on catering by mutual funds with previous results for commercial companies. In section six we draw together the main conclusions and implications of this study.

I. The Research and Market Context

We are not aware of any previous study which has investigated the pricing of split-capital funds, except for Gemmill (2002) which focuses on the zero-dividend preference shares and Adams (ed., 2004) which provides an overview. One reason for this gap may be that very few funds of this kind exist in the United States, because the Investment Company Act of 1940 places relatively strict limits on leverage.[2]

Closed-end funds have market prices both for their assets (the portfolio of investments) and for all of their liabilities (with the exception of bank debt). They provide a laboratory for the study of asset pricing, which has been utilised frequently (see Dimson and Minio-Kozerski (1999) for a review). The predominant focus has been on why the shares of conventional funds trade at a discount to net-asset value. The debate concentrates on whether the discount is a reward for bearing noise-trader risk (e.g. pro: Lee, Shleifer and Thaler, 1991, con: Elton, Gruber and Busse, 1998), or whether it can be explained by "rational" factors such as: illiquid assets and taxes (e.g. Malkiel, 1995) or costs of arbitrage and management expenses (e.g. Pontiff, 1995, Gemmill and Thomas, 2002, Ross, 2002). Whatever the explanation of the discount, it has been a persistent phenomenon in the UK (as in the US) for more than thirty years (see Figure 1).

For the present study, it is important to note that closed-end funds in the UK (known as investment trusts) do not pay tax or obtain tax relief on borrowing[3], so corporate tax plays no role in their choice of capital structure or payout policy. Investment trusts also have no discretion over whether to pay a dividend or not; they are required to pay-through to investors at least 90% of the dividends received on the portfolio. Consequently there is no "dividend policy" for an investment trust to decide upon. The dividend can only be increased in two ways: (i) by changing the composition of the portfolio; or (ii) by increasing the size of the portfolio and financing this with debt, assuming that the cost of the debt is less than the dividend yield on the extra assets.

[2] In the United States the equivalent funds are known as 'dual purpose' or 'multi-purpose' funds.
[3] This has been confirmed by discussions with the Association of Investment Trust Companies.

Split-capital funds have been issued in the UK since 1965 (see numbers in each year in Figure 2). By the end of the 1970s there were 24 split-capital funds out of a total of 165 closed-end funds trading on the London Stock Exchange, with split-capital funds representing 3.5% of the total value (Newlands, 2000). Issuance accelerated from 1987 onwards and by June 2000 there were 82 split-capital funds out of a total of 312 funds trading (13% by value, data from Cazenove and Co.).

Figure 3 compares the numbers of new issues of split-capital funds with those of conventional closed-end funds. Until 1998 split-capital IPOs were much less frequent than those of conventional funds. Then from 1998 to 2001 there was an upsurge in new issues and more than half were of the split-capital type.

Figure 4 illustrates the main features of the funds by year of listing. Prior to 1988 they were predominantly companies with a prime/score split into dividend and capital shares. Thereafter it became common to issue zero-dividend preference shares (zero-coupon bonds) and also whole-fund units. Prospectuses argued that a separation into zero-dividend preference shares and capital shares avoided the discount to net-asset value, but did not explain why this should happen.[4]

To demonstrate the richness of the split-fund structures, consider Jupiter Split which was launched in November 1995 and which expired in October 2004. It comprised:

1) **Zero-dividend preference shares** which paid £2.138 on maturity
   - 41.7% of capital
2) **Annuity shares** which paid £0.066 semi-annually
   - 10.0% of capital
3) **Income shares** which paid all of the dividends and £1 on maturity
   - 28.0% of capital
4) **Ordinary shares** which paid the residual value of the fund on maturity

[4] An early example is given by the prospectus of the River Plate and General Trust listing of September 1987. "On the Board's recommendation, the company's capital structure was changed to that of a split-level investment trust, which eliminated the discount to assets of the share price", as quoted by Newlands (2000).

- 20.3% of capital

5) **Units** which comprised the following package:
   - 25 zeros + 6 annuities + 17 incomes + 12 ordinaries

As an overview of the variety of fund structures, Table 1 gives details for the 82 funds with a split-capital structure which traded on the London Stock Exchange at the end of June 2000. All 82 of the funds had ordinary shares, 69 had zero-dividend preference shares (zero-coupon bonds), 54 had bank loans, 37 had income shares (primes) and 1 had an annuity share. There were also 24 funds with units. These different kinds of share were arranged in 13 different combinations. Counting the zero-dividend preference shares as debt, the average company's liabilities in June 2000 comprised 50.3% equity and 49.7% debt.

II. Data

The data used in this study were collected (by hand) from Investment Trust Companies Monthly, published by Cazenove and Co., a London brokerage. The July issue of the publication was used in each of the years 1994 to 2004 and the data relate to a specific day which is generally one week or ten days before the end of June. The sample is the full universe of funds which existed in the relevant month.

Although it is possible to obtain data on share prices from standard sources (such as Datastream), it is not possible to obtain information on the net-asset-values of split-fund portfolios from such sources and that is why the Cazenove source has been used. In addition, we need up-to-date information on the bank debt of each fund and on the current capital structure, both of which are given in that publication. Our study is the first to investigate the discount to net-asset value of the split-capital funds, which requires that the net-asset value of the fund's portfolio be compared with the sum of the values of all of the different classes of share in existence.

Whenever data on prices appeared to be unusual, they were checked with the Stock Exchange Daily Official List. If a share price fell below 5 pence, that company was

removed from the analysis for that month. A few companies which issued annuities or convertible bonds were removed from the sample, because such features were too few to be incorporated into the cross-section regressions.

The number of companies in the 1994 to 2004 sample is given in column 2 of Table 2; it ranges from a low of 44 in 1996 to a high of 91 in 2001. The table also gives the premium to net-asset-value in each year, measured by the mean, median and value-weighted mean. All of these measures show the same pattern over time. The mean premium has a high of –2.3% in 1998 and a low of –13.6% in 2003 (i.e. a discount of 2.3% to 13.6%).

We also need a sample of conventional funds for comparison. For the conventional funds, we selected all of those funds available in the Cazenove publication which had as their benchmark the Financial Times All Share Index.[5] That benchmark was chosen as it is the same as that used by most of the split-capital funds. Column 2 of Table 3 shows that there were between 21and 26 of these conventional funds available for comparison in each month. The table also gives their mean, median and weighted mean premia (discounts) in each month. The mean shows a high of –2.6% in 1994 and a low of -13.7% in 1999. The median and weighted mean give similar values. Note that although the ranges for premia (discounts) on these conventional funds in Table 3 are similar to those on the split-capital funds in Table 2, year-by-year there are some large differences between the two groups, as will be discussed in the next section.

III. A Comparison of Values for Spit-Capital and Conventional Funds over 1994 to 2004

In this section we compare the market-to-book premia (discounts) of the split-capital funds with those of conventional funds, to see whether splitting of the liabilities raises value. Figure 5 compares the value-weighted mean premia of the two kinds of fund (see Tables 2 and 3 for the data). The premia of the split funds exceed those of conventional funds in 1994 and over the whole period 1998 to 2001; these differences are all

[5] In the earlier years of the sample, a benchmark was not always given and we have included funds with at least 50% of their capital invested in a general portfolio of UK equities.

significant at the 1% level according to t-tests. However, in 2003 the split premia are below those of conventional funds (at the 5% significance level). The differences in 1998 to 2001 are quite large, ranging from +4.9 percentage points in 1998 to +12.6 percentage points in 2001. That indicates that investors placed approximately 5% to 13% extra value on funds which had a split-capital structure in that four-year period.

The line-graph in Figure 6 plots the differences in discounts between split funds and conventional funds over time. It shows a linear increase in the premium advantage of split funds from 1997 to 2001, after which there was a huge collapse so that split funds had a disadvantage of over 5% by 2003. The bar-chart in Figure 6 shows that new issues of split funds were closely aligned with the extent to which their premia exceeded those of conventional funds. There was a "hot issue" period from 1997 to 2001, even though the average split fund did not actually trade at a premium to net-asset value in this period except in 2001 (see Figure 6). [6]

An obvious question is whether a change in the character of the split-capital funds might account for their rise in relative value from 1997 onwards? The uppermost plot in Figure 7 shows that their level of debt (as a proportion of total assets) was rather constant over this period at about 50%. Given that the stock-market in the UK rose by 37% from June 1997 to June 2000, it might have been expected that the leverage of the funds would fall. However, what happened was that leverage was kept high by means of extra bank borrowing. The bottom plot in Figure 7 shows that bank debt rose from about 5% of assets in 1997 to about 30% in 2001. As a proportion of all debt it was then more than 50%.

There is a simple explanation for the extra use of bank debt in this period, namely that it could be increased by existing funds without requiring any new authorisation from shareholders. Debt has the potential to raise the dividend yield. For a fund which has only zero-coupon debt, there is a convex relationship between leverage and dividend yield, as illustrated in Figure 8. If the debt is coupon paying, as with bank debt, then extra leverage will still raise a fund's dividend yield if the coupon charged to the dividend-paying shares of the fund is less than the dividend yield on the shares

[6] Hot issue periods for closed-end funds have been discussed by Lee, Shleifer and Thaler (1991) for the US and by Levis and Thomas (1995) for the UK.

purchased. We argue below that funds were using bank debt in order to raise their dividend yields, with little or none of the interest being charged to the dividend-paying shares of the fund.[7] Holders of dividend-shares in the funds were being favoured at the expense of holders of all other classes of share (ordinary, capital, zero-dividend preference etc.).

IV. Statistical Analyses of Which Features Add Value

4.1 Time-series on parts and units of individual funds

We begin the formal tests of what determines fund value by investigating whether a simple prime/score split into dividend and capital components might explain the extra value of split-capital funds. We are able to do this because about one quarter of the funds have units which recombine the parts into a single traded share. As an example, Figure 9 illustrates that the parts of the M&G Income Fund are on average worth 1.4% more than the traded units over the period of November 1991 to May 2000 and the difference is rather stable (and the mean significant at the 1% level). For our sample we take the 10 funds in July 2000 for which there is a full set of monthly data on the prices of both units and separate components. We find (Table 4) that all ten of the funds have values for their parts which exceed the whole and for eight of them the difference is significant at the 1% level. The range in extra value is from 0.13% to 4.85%, with a mean of 1.33%. The table also shows that if the first year of trading is excluded (which may be a "hot-issue" period and therefore subject to an upward bias), the extra value rises to 1.54% on average.

These results are remarkably similar to those given for primes and scores in the US study of Jarrow and O'Hara (1989), who find that if primes and scores (dividend and capital components) are added together they exceed the ordinary share price by 1-2%. The statistical significance in the present study is such that we can be confident that

[7] To be precise, the extra debt will raise the dividend yield (of a fund's dividend-paying shares) if the yield on the new shares which are purchased with the debt exceeds the extra interest charged to the dividend-paying shares of the fund.

the parts exceed the whole, albeit by a relatively small margin and with fluctuations over time. Such a modest difference in value might be consistent with the costs of arbitrage, which would require buying the whole unit and selling the constituent parts, but that does not explain why the parts should be consistently worth *more* than the units in our study, just as in Jarrow and O'Hara.[8]

Three of the funds (which are managed by M&G) have simultaneous trading of two different kinds of package unit, which allows some refinement of the simple test. The first unit combines income (dividend-paying) and ordinary (capital) shares, while the second adds-in a zero-dividend preference share. The difference between the two kinds of package is therefore just that the latter includes a zero-dividend (zero-bond debt) component. Table 5 compares the values of the two kinds of package. When a zero-dividend preference share is present the parts exceed the whole by an average of 2.47% (and the difference is significant for all three companies). When such a share is not present, the extra value is only 0.60% on average (and significant for only one company). This suggests that investors have a preference for splitting-up the liabilities if there is a debt component, a theme on which we focus in the next section.

4.2 Time-series of cross-sections of all funds

We want to know which features of a fund contribute to its high or low valuation relative to others. If there is a time-varying demand for a feature, its contribution will not be the same in each year and so we examine separate cross-sections in June of each of the 11 years, 1994 to 2004. In particular, we hypothesise that debt and dividend yield will have a larger positive impact in 1998-2001, because we already know from section III that average premia on split-funds are high relative to conventional funds in these years.

The most general formulation of the hypothesised relationship between premia and characteristics is:

[8] Barber (1994) and Huckins (1995) discuss possible explanations for primes and scores. As the components give the holder more flexibility than the units, the asymmetry may not be surprising.

$$Premium_j = a + b\ \{\log(maturity_j + 1) x\ indic_j\} + c\ dum\text{-}inc_j + d\ dum\text{-}loan_j + e\ dum\text{-}zero_j + f\ dum\text{-}unit_j + error_j \quad (1)$$

where $premium_j$ is the premium over net-asset-value, $maturity_j$ is the number of years remaining until the fund is wound-up, $dum\text{-}inc_j$ is a dummy variable for the presence of a separate income share (i.e. an extreme form of dividend-paying share which does not pay any residual capital value at wind-up), $dum\text{-}loan_j$ is a dummy variable for the presence of a loan, $dum\text{-}zero_j$ is a dummy variable for the presence of a zero-dividend preference share (i.e. a zero-coupon bond), $dum\text{-}unit_j$ is a dummy variable for the presence of a traded unit which aggregates the separate components, and $error_j$ is a disturbance term. The subscript j denotes an individual fund. This is a very simple formulation and, except for the inclusion of maturity, is equivalent to an analysis of variance. We include maturity because investors may have a preference for funds which have long or short lives – we have no prior view on this. The maturity variable plus 1 is logged, as a non-linear effect is to be expected, and it is multiplied by a dummy variable denoted '$indic_j$' which takes on a value of –1 if the j^{th} fund is trading at a premium and +1 if it is trading at a discount.[9] The method of estimation is OLS, with the White correction for heteroscedasticity.

The results from estimating equation (1) are summarised in the left-hand segment of Table 6 (headed Regression #1). For simplicity, only whether a coefficient is significant or not and its sign are shown in the table. [10] The table indicates that the presence of a zero-dividend preference share is the dominant (and positive) feature in raising the premium of a fund, being significant in six of the seven years in the period 1994 to 2000. The presence of a loan is also positive and significant in 1999 and 2000, which is the time at which loans were rising as a proportion of total debt. In 2001-2002 no feature has a significant impact on the premium, but in 2003 the presence of a loan has a negative effect. By June 2001 the stock-market had already fallen and in 2001-02 there was a high level of volatility. The negative impact (1% level significance) of a loan in

[9] At maturity a fund must expire at a premium of zero. If a fund is trading at a premium, then the longer the fund has to run, the higher that premium can be so the effect of maturity is likely to be positive. If a fund is trading at a discount, then the converse argument holds and the effect of maturity is likely to be negative. The use of the '$indic_j$' dummy variable allows for these opposite effects.
[10] A full set of results is available on request. The significance of the coefficients on the maturity variable are not included in the table – the coefficients are negative and significant at the 1% level in all but one year, 2004.

2003 is therefore consistent with a story in which investors had realised that funds with bank loans were particularly at risk of collapse. Not only did the loans have covenants which potentially demanded early repayment, but also funds with loans had more debt as a proportion of total assets; in June 2000, for example, the 45 funds with loans had an average of 52% debt, whereas the 28 funds without loans only had an average of 38% debt.

The middle section of Table 6 (headed Regression #2) gives results from simplified regressions, in which the two dummy variables for loans and zero-dividend preference shares are replaced by a single variable for debt as a proportion of assets (debt %). The period 1995-2000 now has total debt as the most significant factor in determining the premium of a fund, with a negative effect arising in 2002 but not in 2003. Consistent with the impact of zero-dividend preference shares in the previous regression, the effect of debt in this regression has reverted to its usual positive impact by 2004.

The third set of cross-section regressions (headed Regression #3), which is reported in the right-hand segment of Table 6, uses an even more parsimonious specification in which the only independent variables are time to maturity and the proportion of debt. In this specification debt has a significantly positive impact on the premium over the 7 years from 1994 to 2000, then a negative impact in 2002 and again a positive impact in 2004.

The results from these annual cross-sections of what determines the premium may be summarised as follows: (i) more debt has a positive impact on fund values in the second half of the 1990s and there are separate impacts of zero-dividend preference shares and loans at the end of the decade; (ii) the positive influence of debt on values disappears after the stock-market fall of 2000-2001 and is significantly negative by 2002-2003 but comes back in 2004; and (iii) the impacts of other variables (such as separate income shares or listed units) are occasionally significant in particular years, but they show no pattern.

4.3 Debt or Dividend Yield?

Having shown that debt increases fund values in the second half of the 1990s, we still need to explain why investors sought leverage at that time: was the motivation to obtain higher total returns as the stock-market rose (timing or growth), or was it because debt magnified the yield on the dividend-paying shares (dividend yield)? If the motivation was yield, then we should find that funds with higher dividend yields (regardless of any terminal payment on the shares) had higher values. In effect, the hypothesis to be examined is that for some investors the dividend yield was the salient feature of a fund.

To test this hypothesis we now concentrate on those funds which had (i) only one class of dividend-paying share and (ii) some debt. We eliminate funds with more than one class of dividend-paying share because their "salient" yields are not clear.[11] We also eliminate funds with no debt, because the presence of many funds with zero observations for debt would generate a bias in the cross-section regressions. There remain in the sample between 22 and 59 funds for each year over 1994 to 2004.

We showed earlier (Figure 8) that in theory debt and yields are closely related for funds. To check this in practice, Table 7 gives the correlation between debt and yields for the revised sample of funds: it is between 0.555 and 0.904 over the years 1994 to 2004, so there is a close relationship. As an illustration, Figure 10 plots the observed relationship between debt and dividend yields for June 1998, at which time the correlation was 0.904. The relationship appears to be approximately linear, rather than convex as the theory would predict.

We proceed by estimating two separate cross-section regressions in each year. The first has fund premium as a function of maturity and quoted dividend yield, i.e.

$$\text{premium}_j = a + b\ \{\log(\text{maturity}_j + 1) \text{x indic}_j\} + c\ \text{div-yield}_j + \text{error}_j \qquad (2).$$

The second regression uses debt instead of dividend yield as the second independent variable, i.e.

$$\text{premium}_j = a + b\ \{\log(\text{maturity}_j + 1) \text{x indic}_j\} + c\ \text{debt\%}_j + \text{error}_j \qquad (3).$$

[11] For example, in June 2000 there were 33 of the 73 funds included in Table 2 which had two kinds of dividend-paying share, so after eliminating these there remained 40 funds for analysis.

If dividend yield is the driver for fund premium, then we expect to find that it has a significant effect in more years than does debt. The results in Table 8 confirm this hypothesis. The quoted dividend yield has a significantly positive impact (at the 5% level or better) on a fund's premium for 5 of the 9 years from 1994 to 2001 and a significantly negative impact in 2002. By contrast, debt has a significantly positive impact (at the 5% level or better) in only 2 years and a significantly negative impact in no year. There is therefore reasonably strong statistical evidence that it was yield rather than debt that caused the premia on split funds to be high in the late 1990s; a set of investors was seeking "value" rather than "growth", even when the stock-market was in an apparent growth phase.[12]

There are three other pieces of evidence which are consistent with dividend yield rather than debt being the driver of fund premia. First, the proportion of debt in funds' capital structures only rose by 2% between 1997 and 2000 (from 44% to 46%, as shown already in Figure 7), yet the extent to which the premia of split funds exceeded those of conventional funds rose by 9% in this period. It seems that relative premia changed even though there was little change in leverage. At the same time, the average yield on the dividend-paying shares (of the sub-set of funds which had only one dividend-paying class of share) rose from being 2.57 times that of the FT All-Share Index in 1997 to 3.92 times that of the index in 2000. (The yield numbers are 8.92% and 8.31% respectively for the dividend shares, and 3.47% and 2.12% respectively for the index). [13]

Second, the prospectuses used to attract investors to new issues tended to emphasise the dividend yield as the "selling point". For example, "*In the current falling interest rate environment, the days of double digit income returns appear to be long gone. However, the thirst for income remains undiminished"*, Gartmore Monthly Income Brochure, April 2001. Industry analysts have also emphasised that a high dividend yield was critical to making a new issue attractive, where *"…Attractive, in this context, meant*

[12] As a robustness check, the equations were also estimated using a linear specification for maturity and the results were even more supportive of dividend yield rather than debt being associated with the level of the premium.

[13] As the extra yield on the funds relative to the index was not being achieved with extra leverage, it must have been achieved by increasing the proportion of high-yield shares in the portfolio. An investigation by the Financial Services Authority (FSA,2002) shows for March 2002 that 83 out of 134 slpit-capital funds had cross-invested in the shares of other split-capital funds, many of which were high-yielding.

creating very high starting yields on the ordinary shares in which case the success of a new trust was assured", Newlands (2004) in Adams (ed., 2004, page 35).

Third, the rise in the stock-market over 1997-2000 led to a sharp fall in dividend yields relative to interest-rates (which were stable), so the conditions were right for a dividend clientele to emerge.

4.4 Could the attraction have been a tax effect?

Most split-capital funds include zero-dividend preference shares. These are the only zero-coupon bonds in the UK market which are taxed at capital rates, and then only at maturity. It is also possible to defer the payment of tax by rolling-over a maturing share into a succeeding issue. The question then arises of whether this attractive tax feature may explain the extra value of the split funds relative to conventional funds in the late 1990s? The answer appears to be "no" for two reasons. First, there was no change in the tax treatment of these preference shares over this period, so tax cannot explain the increase in relative values or their subsequent decline. Second, the *maximum possible* value of the tax benefit would be a gain of about 4% in fund value – based on a tax rate of 40%, 5-year bonds comprising one third of the capital structure and an interest rate of 8% – so the magnitude of any potential tax effect is too small to explain the run-up in fund values of 12% over 1998 to 2001.[14] When the tax benefit was threatened by government with removal in May 1995, the effect on fund values was a fall of about 1.4%, so the potential for tax to be the causal factor is again confirmed to be small.

[14] At a yield of 8%, a taxed bond is worth £68.06 and an untaxed one is worth £79.10, a difference of £11.04 . If the bond is one third of a fund's liabilities, then the potential gain is 11.04/3 = £3.68 per £100 of fund.

V. Split-Capital Funds and the Catering Theory of Dividends

We have shown that split-capital funds were successful in the period 1997-2001 because they catered to the demand by some investors for dividend yield. It is interesting to compare these results with those of Ferris et al (2004), who study whether dividends have been disappearing in the UK and what the explanation may be. They find that the market-to-book of industrial companies which paid dividends, relative to companies which did not pay dividends, was declining over 1997 - 2001, as shown in Figure 11. This suggests that far from there being a *premium* for companies which paid dividends, there was actually an increasing *discount* at this time, consistent with a rising stock-market in which investors were seeking growth. They also find that the propensity of companies to pay dividends was falling in this period (see Figure 11). This suggests that, if anything, companies were reducing dividends in this period in response to investors' preferences. [15] It seems that at the same time as split-capital funds were catering to an increased demand for dividend yield, there was both a decline in the aggregate demand for dividends and a decline in the propensity of companies to pay dividends. These contrasting results require an explanation.

Our view of how these different results may be rationalised is as follows: it is that there are different kinds of investor, whose demand for dividends is not affected by the same factors. In the late 1990s the representative investor was not interested in value stocks with high dividend yields, but in growth stocks. The resulting dividend premium (in terms of market-to-book) was therefore low. However, as the stock-market rose in this period the supply of dividend yield was automatically reduced and new investors, for whom dividend yield was important, became dissatisfied. This clientele of dividend-yield-seeking investors drove-up the value of split-capital funds and induced the great expansion of new issues which we have documented. The implication is that there is a clientele of retail investors whose time-varying demand for dividends is different from that of the market as a whole. Dividends are not irrelevant for these investors.

[15] It should be noted that Ferris et al (2004) are agnostic about whether this evidence supports the catering theory of Baker and Wurgler (2004a) or not.

VI. Conclusions and Implications

6.1 Conclusions

When arbitrage is costly, dividend policy is no longer irrelevant (c.f. Modigliani and Miller, 1958) and investors' preferences have the potential to affect share prices. If the demand for dividends is time-varying, then in some periods the share-prices of dividend-paying companies will be bid up (or down) relative to the prices of non-dividend-paying companies. Companies will start to pay dividends or stop doing so in response. That is the catering theory of Baker and Wurgler (2004a).

The evidence from mutual funds which is used in this paper is strongly supportive of this theory. The funds which we examine over 1994 to 2004 are split-capital closed-end funds which have a limited life and a complicated capital structure (having several different classes of listed share). Many split-capital closed-end funds were issued in the UK in the 1998-2001 period and they traded at a 9% premium to conventional funds. The salient feature of these funds was their high dividend yield. Baker and Wurgler are not able to explain why the demand for dividends should vary over time, but here the mechanism is quite clear: it was the increase in the level of the stockmarket which caused dividend yields to fall and led to the rapid growth of high-yield split-capital funds. The time-varying supply of dividend yield by the stockmarket led to a time-varying demand by small investors for high-yield funds.

High yields on the split-capital funds were generated mainly by using leverage, with debt being about 50% of total liabilities. Increasing the size of a fund via debt will only raise the dividend yield if the coupon rate on the borrowing is below the dividend yield on the extra shares purchased. Split-capital funds achieved this either by having zero-coupon debt, or by having bank loans for which the interest was only partially charged to holders of the dividend-paying shares in the fund. Using cross-sections of between 44 and 91 funds, we find that the more debt a fund had, the higher its value in each year 1994-2000. Bank debt made its own identifiable contribution to extra value in 1999-2000, which was the time at which such debt (as contrasted with bonds) became a significant part of the capital structure.

It is important to distinguish between the hypothesis that investors were just seeking leverage and the alternative hypothesis that investors were seeking dividend yield. As debt and yield are closely related, this is not straightforward. We have done this by analysing for each year a sub-set of the funds which have only one class of dividend-paying share. By estimating cross-section regressions in which a fund's premium is related either to the proportion of debt in the capital-structure or to the dividend-yield, we find that yield had a significantly positive impact in 5 of the 9 years 1994 to 2001 (at the 5% level or better), whereas debt had a significant influence in only two of these years. Two additional pieces of evidence support the hypothesis of yield as the salient feature: first, fund advertising emphasised yield; and second, the average proportion of debt in the capital structure did not change much over these years.

Split-capital funds can be viewed as a mechanism by which equity portfolios are stripped into various components. Stripping of the S&P500 into prime (dividend) and score (capital) components has been advocated by Brennan (1998). By examining some funds which issue whole-fund units, we are able to estimate a modest gain of 1-2% in value from separating a portfolio of shares into its components. This result is very close to that of Jarrow and O'Hara (1989) for individual shares in the United States and is consistent with arbitrage costs. For split-capital funds it was therefore not the stripping of equities which explained their 9% extra value in the market over 1998-2001, but the extra yield which was generated from raising leverage after the stripping had been done.

A study of dividend policy in the UK by Ferris et al (2004) indicates that the general demand for dividends and the propensity of industrial companies to supply them were both low in the late 1990s. This is similar to the situation in the US at that time (Baker and Wurgler, 2004a and 2004b, Julio and Ickenberry, 2004). Yet we find that a group of investors was seeking funds with high dividend yields at that very time. This suggests that a theory of the demand for dividends needs to take account of different motivations for different groups of investors as the level of the stockmarket changes. The purchasers of dividend shares of split-capital funds in the UK were retail investors. These are precisely the investors for whom arbitrage is costly and so are likely to reveal their preference for dividend yield in retail financial products.

6.2 Implications

One of the well-known anomalies concerning closed-end funds is why they are ever issued in the first place, because investors should realise that a fund launched at parity (of the share price with net-asset-value per share) will soon be trading at a discount (Lee et al, 1991). This paper demonstrates that investors in split-capital funds in the late 1990s were attracted by a "salient feature" – the dividend yield. It suggests the need for a theory of new issues in which investors are not particularly aware of risk and focus on a salient feature. It remains to be seen whether such issues depend on investor "irrationality", or occur when the future path of the salient feature is subject to a high level of uncertainty and might therefore justify high prices (consistent with the role played by uncertain future growth rates in Pastor and Veronesi (2004), for example).

Many split-capital funds collapsed after 2001 because of their high leverage. The experience suggests, however, that there is a latent demand for dividend strips and tends to support the arguments of Brennan (1998) for a market in these. The weakness of the split-capital fund structure was the difficulty in knowing what a fair price was for a wide variety of dividend shares, each with a different level of risk. The funds were too complicated and not well-researched because they were aimed at retail investors. This failed experiment in stripping portfolios does not invalidate the argument that a market in standardised stock-index strips could be a useful development for pension-fund management.

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Table 1
The Universe of Split-Capital Funds in June 2000 and their Characteristics

class	Ordinary share	zero-dividend preference share	loan	income share	Unit	Annuity	number in class
1	x	x	x				28
2	x	x					9
3	x	x	x	x			9
4	x		x	x			6
5	x	x			x		5
6	x	x		x	x		5
7	x	x	x	x	x		5
8	x	x		x			4
9	x	x	x		x		3
10	x			x			2
11	x			x	x		3
12	x		x	x	x		2
13	x	x	x	x	x	x	1
total number	82	69	54	37	24	1	82 267

An ‘x’ in a cell denotes that this particular class of fund has the characteristic shown by the column-heading. For example, class 1 consists of funds which have ordinary shares, zero-dividend preference shares, and loans. There are 28 such funds. Data are from the Cazenove Investment Trusts Monthly Report and relate to the last recorded week in June of year 2000.

Table 2
Sample of Split-Capital Funds and their Average Premia in June of Each Year

Year	Number of funds	Statistics Relating to the Premia over Net-Asset Value				
		mean	median	standard deviation	value-weighted mean	value-weighted standard deviation
1994	52	3.699	4.294	8.630	4.760	7.526
1995	53	-4.074	-3.148	5.798	-3.466	4.472
1996	44	-7.607	-7.233	6.896	-7.581	6.162
1997	52	-8.367	-9.107	7.193	-8.233	6.336
1998	49	-2.326	-2.272	6.394	-2.221	5.814
1999	50	-5.546	-6.797	8.201	-5.782	-6.716
2000	73	-3.036	-2.342	6.540	-3.119	7.065
2001	91	4.569	5.096	12.102	3.292	10.005
2002	65	-4.866	-4.451	37.854	-5.412	12.468
2003	57	-13.602	-9.521	12.167	-12.607	11.339
2004	48	-10.536	-8.375	5.811	-9.483	5.257

The data relate to all of the split-capital funds included in the study for the last recorded week in June of the year shown. Data are from the Cazenove Investment Trusts Monthly Report. A negative premium is a discount.

Table 3
Sample of Conventional Funds and their Premia in June of Each Year

Year	Number of funds	Statistics Relating to the Premia over Net-Asset Value				
		mean	median	standard deviation	value-weighted mean	value-weighted standard deviation
1994	23	-2.620	-2.142	6.329	-4.771	6.350
1995	24	-2.963	-1.876	5.492	-5.478	5.873
1996	22	-5.926	-5.650	7.639	-9.983	7.346
1997	23	-9.066	-11.253	6.381	-9.869	5.834
1998	22	-6.631	-8.300	6.000	-7.077	5.892
1999	22	-13.701	-15.454	6.240	-13.136	5.730
2000	22	-12.775	-13.529	5.824	-12.749	5.405
2001	23	-8.586	-8.396	7.595	-9.314	5.272
2002	23	-6.099	-2.894	8.155	-5.122	6.286
2003	21	-6.453	-5.213	6.730	-6.937	6.708
2004	26	-8.565	-7.745	6.895	-11.373	6.435

The data relate to the sample of conventional closed-end funds included in the study for the last recorded week in June of the year shown. The choice of funds is based on their having more than 50% of their investments in UK equities and a benchmark (if given) of the FT All-Share Index. Data are from the Cazenove Investment Trusts Monthly Report. A negative premium is a discount.

Table 4
Comparisons of Values for Component Parts of Funds Relative to Traded Package Units, based on month-end data up to June 2000.

Fund	full sample period			sample excluding first year of trading		
	Extra value of parts %	t-value	number of monthly observ-ations	Extra value of parts %	t-value	number of monthly observ-ations
Aberforth	0.09	0.71	111	-0.03	-0.21	99
F&C Special Utility	0.52	4.49***	65	0.38	3.20***	53
Gartmore British	0.13	0.33	23	0.29	0.85	11
Gartmore Scottish	1.94	8.10***	107	2.16	7.28***	95
Jupiter Split	1.49	3.98***	55	1.88	4.14***	43
Lloyds Smaller	0.45	4.31***	101	0.40	3.72***	89
M&G Equity	1.28	5.96***	53	1.53	6.39***	41
M&G High	4.85	9.28***	41	6.27	11.81***	29
M&G Income	1.01	7.66***	104	1.09	7.58***	96
M&G Recovery	1.54	9.79***	100	1.47	9.95***	88
AVERAGE	1.33	-	-	1.54	-	-

The table reports on the percentage by which the component parts of a fund exceed in value the unit which trades on that fund. The sample comprises end-month observations for the 10 funds which, at the end of June 2000, have units and for which data are available for all parts from Datastream. The full sample (first three columns) includes all months of data available for a fund. The reduced sample (last three columns) excludes the first twelve months of trading in a particluar fund, in order to remove any new-issue effects.

*** denotes significantly different from zero at the 1% level

Table 5
Comparison of Values for Component Parts of Funds Relative to Traded Package Units, With/Without Zero-Dividend Preference Shares

Fund	Comparison #1	Comparison #2	number of monthly observations	t-value for test of difference
	extra value of parts **including** zero-dividend preference share	extra value of parts **excluding** zero-dividend preference share		
M&G Income	1.016% *** (1.359)	0.080% (1.336)	104	5.01***
M&G High	4.859% *** (3.351)	1.325% *** (2.683)	41	5.27***
M&G Recovery	1.542% *** (1.547)	0.309% (2.085)	100	4.75***
AVERAGE	2.47%	0.60%	-	-

The table gives the percentage by which the values of the parts of each fund exceed the values of the units traded on each fund. In the column headed 'comparison #1' the parts and units include a zero-dividend preference share. In the column headed 'comparison #2' the parts and units do not include a zero-dividend preference share. The final column of the table gives values for a t-test, based on unequal variances, of whether the extra value in comparison #1 exceeds the extra value in comparison #2.

The data are for the end of each month, up to June 2000. The source is Datastream.

Numbers in brackets are standard deviations
*** denotes significantly different from zero at the 1% level

Table 6
Significance of Coefficients in Cross-Section Regressions to Explain Premia

	Regression #1				Regression #2			Regression #3
year	income	loan	zero	unit	income	debt%	unit	debt%
1994			+					++
1995			++			++		++
1996						+		+
1997			+++	+		+++		+++
1998	+++		++		+++	+++		++
1999		++	++			+		+
2000		++	+++	-		+++		+++
2001								
2002						- -		- - -
2003		- - -						
2004			++	++		++	+++	++

Each cell in the table indicates whether a particular feature of the cross-section of funds has a significantly positive or negative effect on premia in the year shown. Each regression relates the premium in cross-section to a fund's maturity and the variables specified above, consistent with equation (1) of the main text.

+/- indicates a positive/negative effect significant at the 10% level
++/-- indicates a positive/negative effect significant at the 5% level
+++/--- indicates a positive/negative effect significant at the 1% level

Table 7
The Correlation Between Debt% and Yield% for Cross-Sections in Each Year

year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
number of funds	26	24	22	25	22	22	40	59	42	35	28
correlation	.625	.555	.756	.746	.904	.764	.840	.642	.632	.696	.816

The table gives the simple correlation of the percentage of debt in the capital structure of funds with their dividend yields. The data relate to the last week in June of each year and come from Cazenove Investment Trusts Monthly Report.

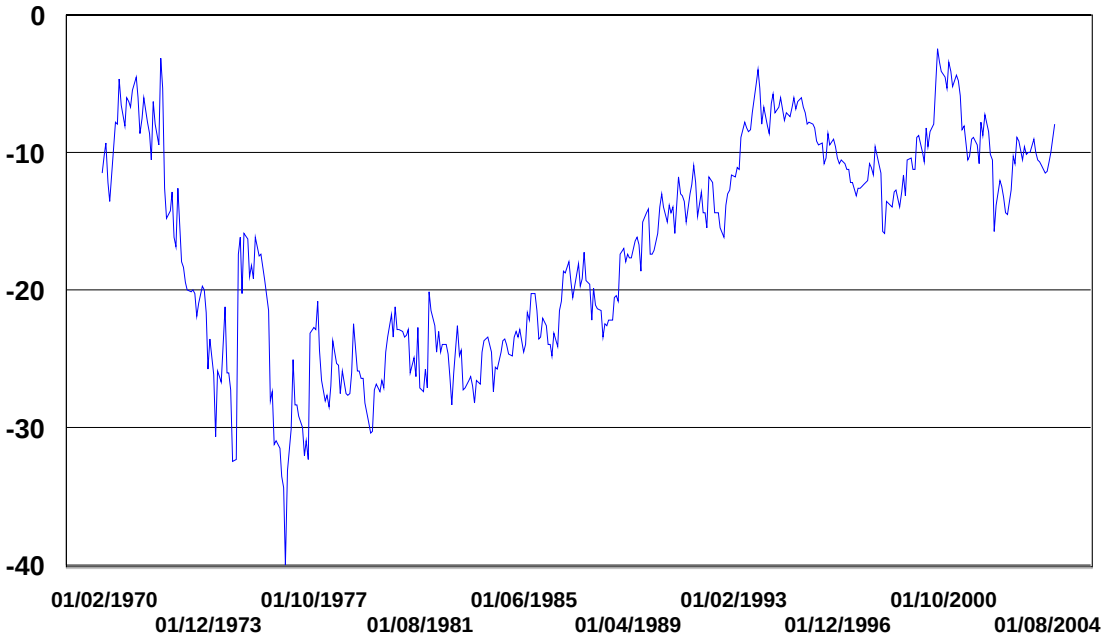
Table 8
Premium as a Function of Yield% or Debt%

year (no. of funds)	coeff. on yield	significance	coeff. on debt	significance
1994 (26)	0.163		-0.031	
1995 (24)	0.438	+ + +	0.116	
1996 (22)	0.368		0.138	+
1997 (25)	0.741	+ + +	0.252	+ + +
1998 (22)	0.368	++ +	0.072	+
1999 (22)	1.101	+	0.136	
2000 (40)	0.504	++	0.123	+++
2001 (59)	0.352	+ + +	-0.013	
2002 (42)	-0.160	- -	-0.100	
2003 (35)	-0.064		-0.132	
2004 (28)	0.010		0.012	

The table gives the results of regressing premia in June of each year against maturity (a control variable) and then either including the dividend yield or the percentage of debt. The precise formulations are given in the main text as equation (2) and equation (3), respectively. For simplicity, only the coefficients on dividend yield and percentage of debt are given. The years and number of observations are given in the first column.

+/- indicates a positive/negative effect significant at the 10% level
++/-- indicates a positive/negative effect significant at the 5% level
+++/--- indicates a positive/negative effect significant at the 1% level

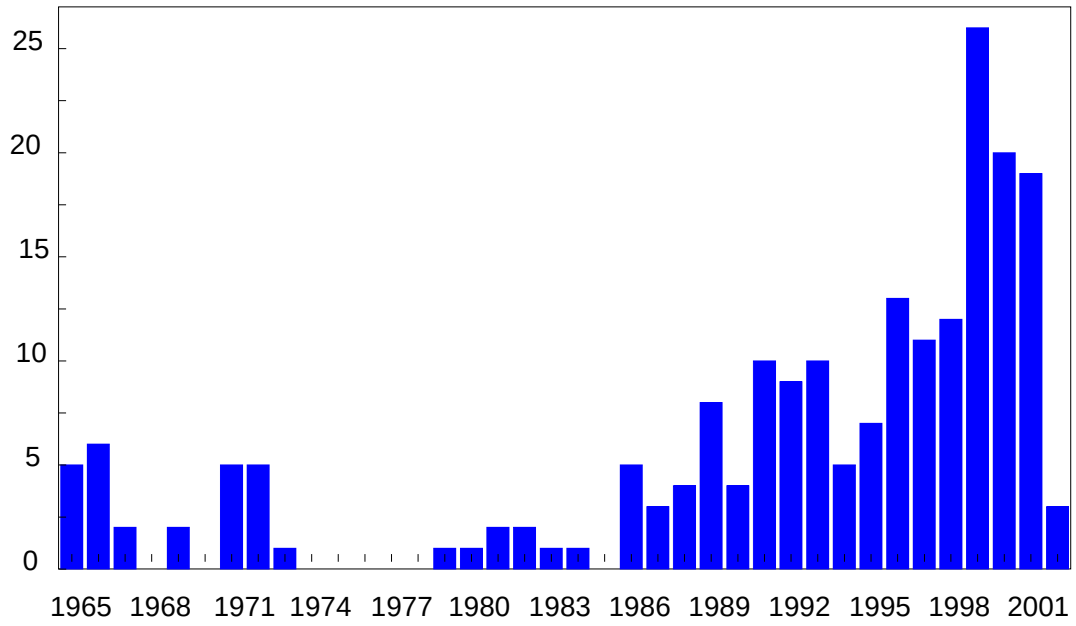
Figure 1
Discounts on Closed-End Funds in the U.K.



Source: Datastream

The figure gives the average discount at the end of each month of all conventional investment trusts (closed-end funds) traded on the London Stock Exchange.

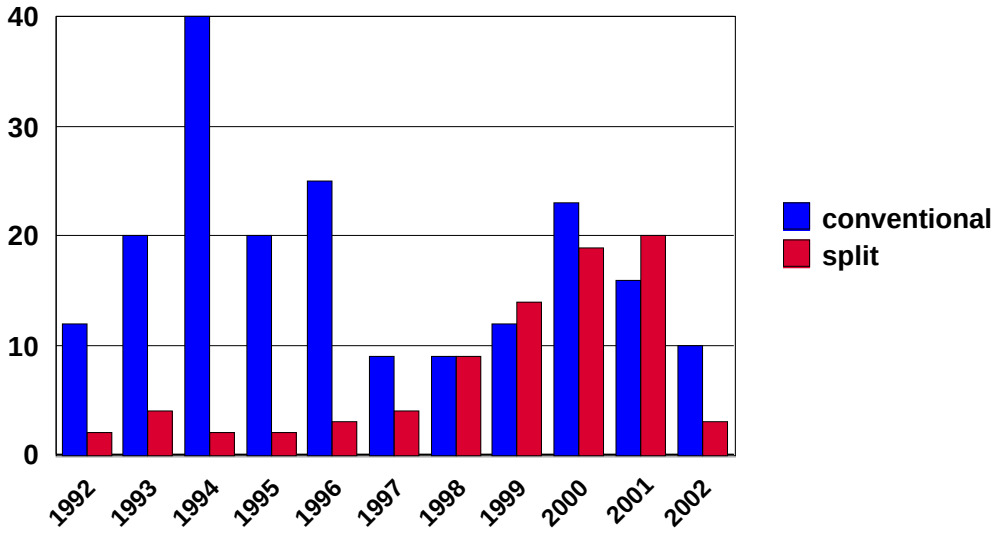
Figure 2
Split-Capital Fund Listings by Half-Year Period



Source: Williams de Broe and Credit Lyonnais

The figure gives the number of new listings of split-capital closed-end funds on the London Stock Exchange in each six-month period. These listings include re-organisations of existing closed-end funds.

Figure 3
Initial Public Offerings of Conventional and Split-Capital Funds in the U.K.

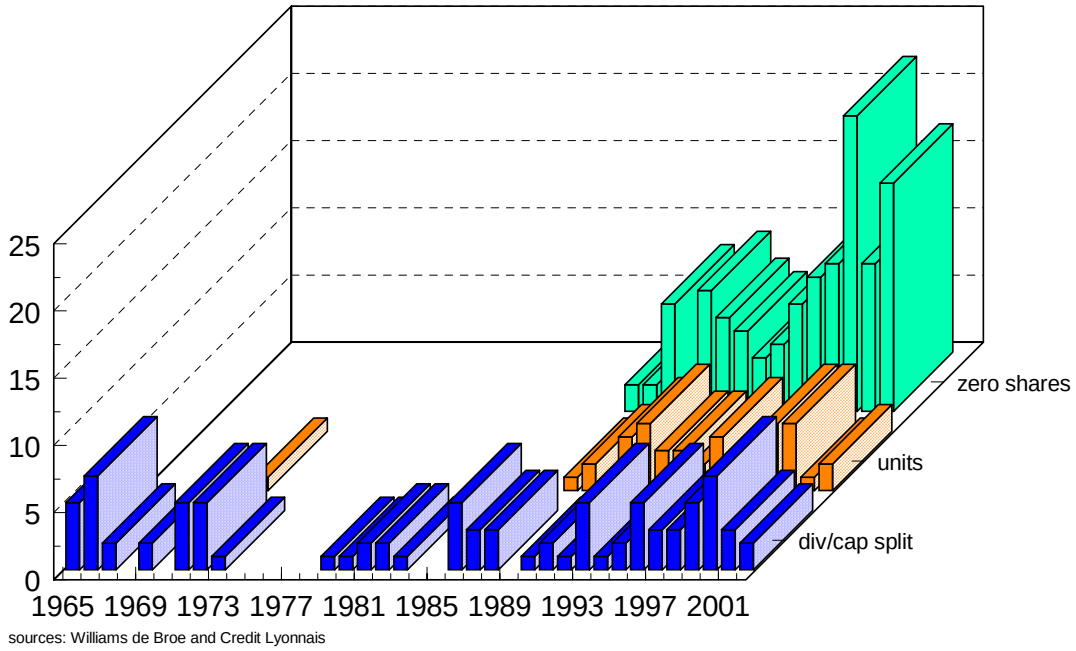


Note: the numbers here exclude re-organisations

The figure gives the number of initial public offerings of new closed-end funds (excluding re-organisations) by year on the London Stock Exchange, divided into split-capital and conventional categories.

Source: Credit Lyonnais

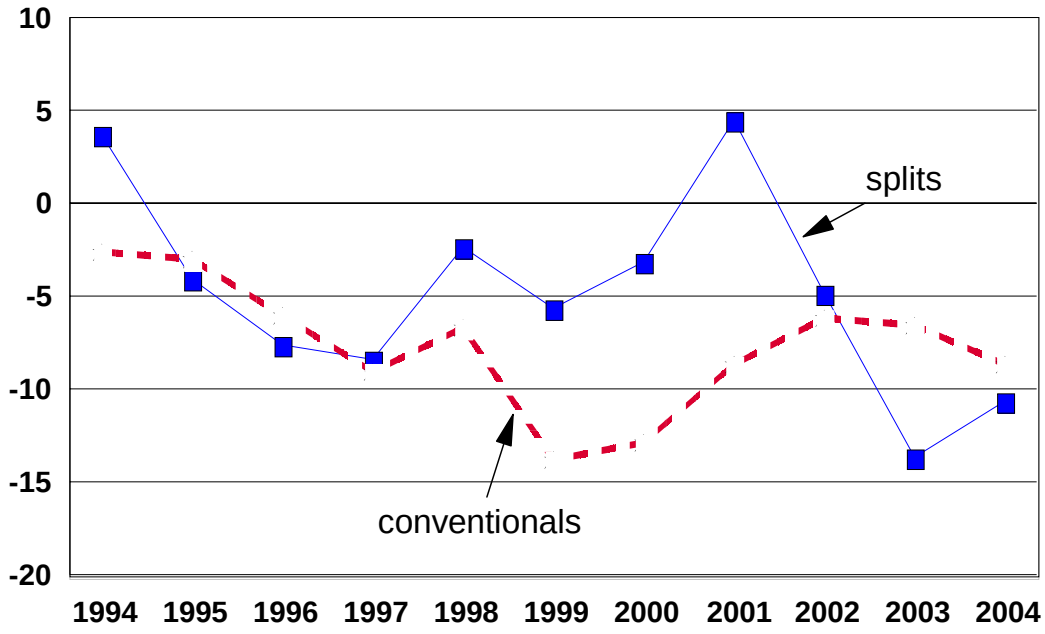
Figure 4
Split-Capital Fund Features by Year of Listing



sources: Williams de Broe and Credit Lyonnais

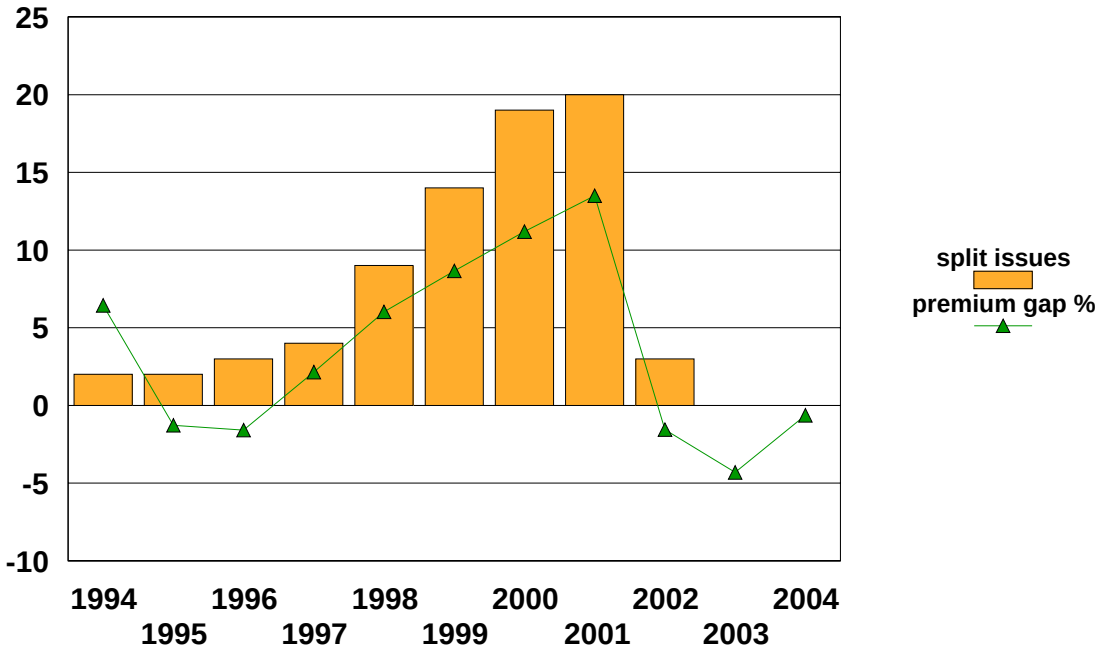
The figure gives the number of new listings of shares of split-capital closed-end funds on the London Stock Exchange, by year. The three categories of share given are: 'zero shares', which are zero-dividend preference shares (equivalent to zero-coupon bonds); 'div/cap split', which are fund issues which include separate dividend and capital shares; and 'units', which are traded instruments which bring together the separate parts of a split-capital fund.

Figure 5
Comparison of Premia (Discounts) of Split-Capital and Conventional Funds (unweighted averages)



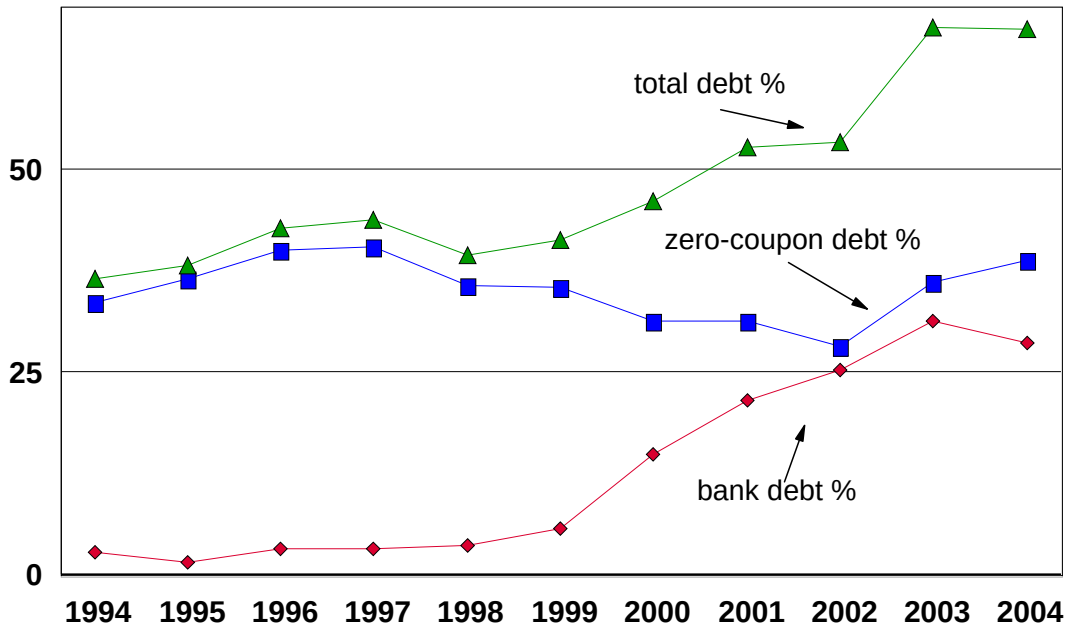
The figure gives the arithmetic average (unweighted) discounts for a sample of conventional closed-end funds and for the sample of split-capital closed-end funds used in this study. The data are for the last recorded date in June of each year, as given in Cazenove Investment Trusts Monthly Report. The discounts have been calculated in this study and are not available otherwise.

Figure 6
New Issues of Split-Capital Funds and the Premia of Split-Capital Funds Relative to Conventional Funds



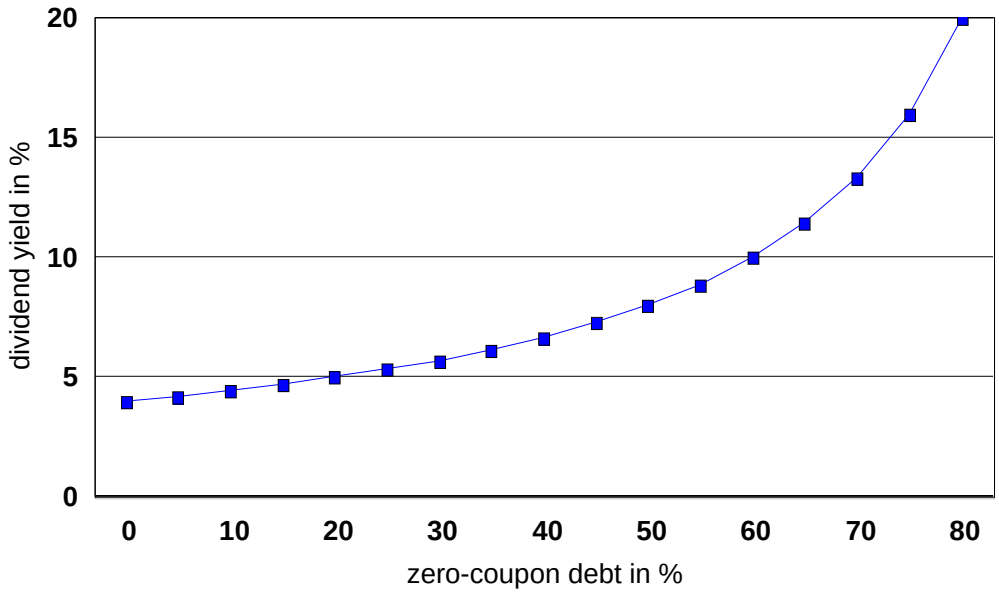
The line denoted 'premium gap' plots the difference between the average premium (discount) on split-capital funds and that on conventional funds, for June of each year. The histogram denoted 'split issues' gives the number of new issues of split-capital closed-end funds in that year.

Figure 7
Debt and Its Components as a Proportion of Total Liabilities of Split-Capital Funds



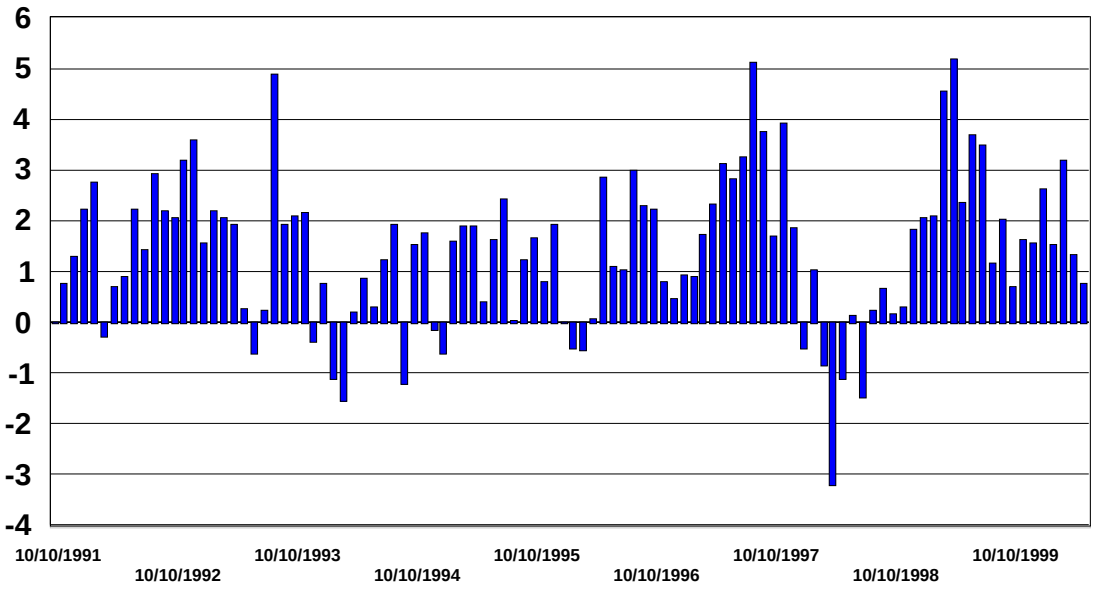
The figure gives the proportion of total liabilities for the funds which is made-up of bank debt and zero-coupon debt, in June of each year. The top line gives a total of these two components.

Figure 8
The Theoretical Relationship between Zero-Coupon Debt and the Yield on the Dividend-Shares of a Split-Capital Fund



The figure assumes a fund which has a portfolio with a 4% dividend yield and two classes of share: a dividend share and a zero-coupon preference share (zero-coupon debt). It then shows how an increase in the zero-coupon debt raises the dividend yield on the dividend share.

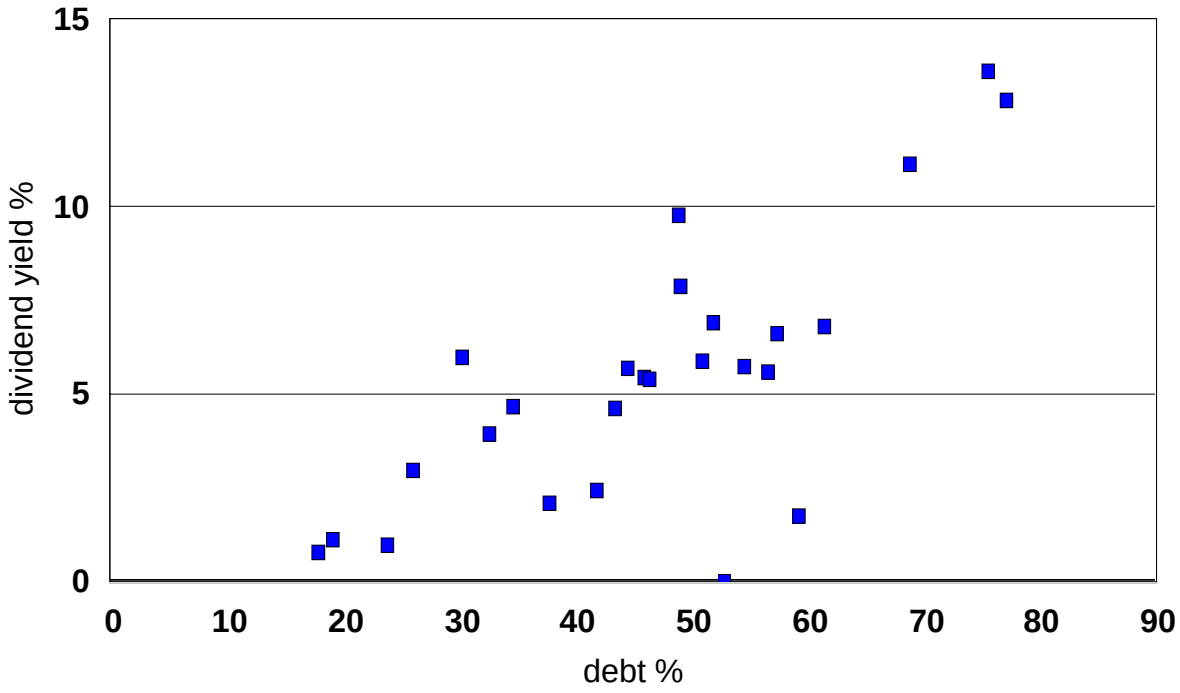
Figure 9
Extra Value of Parts over Units in percent for M&G Income Split-Capital Fund



average = +1.4% (t = 9.6)

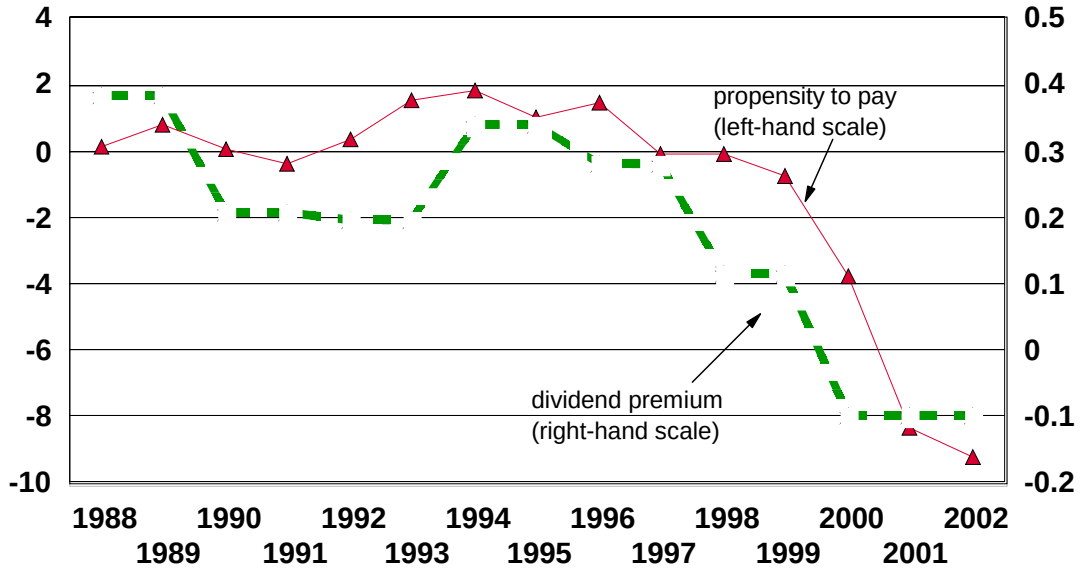
The figure gives the additional value of the parts of the M&G Income Fund relative to the Units which are traded on this fund. The data are monthly, from Datastream, and begin on 10th October 1991 which was the issue date.

Figure 10
Debt and Dividend Yield for Sample of Split-Capital Funds in June 1998



The figure plots the dividend yield and percentage of debt for 22 funds in June 1998. The funds are those which have only one class of dividend-paying share. The correlation of the dividend yield and percentage of debt is 0.904 .

Figure 11
The Dividend Premium and Propensity-to-Pay Dividends for UK Non-Financial Companies



Source of data: Ferris et al, 2004

The figure compares the 'dividend premium' and 'propensity to pay' dividends for UK non-financial companies over 1988 to 2002. The dividend premium is defined as the log of the ratio of the market-to-book of dividend-paying companies to the market-to-book of non-dividend-paying companies. The propensity to pay dividends is measured as the probability that a company pays a dividend, conditioned by size, growth-rate and market-to-book.