DIVIDEND DISPLACEMENT, MARKET VALUE, REGULAR AND SPECIAL DIVIDENDS, AND SHARE BUYBACKS IN THE UK

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Prior empirical research, especially in the UK, has established a positive relationship between market value and dividends in cross-sectional regression analyses. This result holds after controlling for the effects of earnings, book value, major media advertising expenditures, research and development expenditures, capital expenditures, capital contributions and ‘other information’. Papers reporting this result include, for example, Rees, 1997, Akbar and Stark, 2003, Shah, Stark and Akbar, 2009, Dedman, Mouselli, Shen and Stark, 2009, all in the UK, and Fama and French, 1998 and Hand and Landsman, 2005, in the USA.

The empirical result appears to be at odds with theoretical work on the relationship between accounting numbers and market value. For example, Ohlson (1995), following Miller and Modigliani (1961), suggests that the overall impact of dividends ought to reduce market value on a one-to-one basis (dividend displacement). Dividend displacement then implies that, in a regression involving market value as the dependent variable, and containing book value and measures of dividends within the set of independent variables, the negative of the estimated coefficient of book value plus the estimated coefficients of the measures of dividends ought to be statistically indistinguishable from minus one. Such a result is strongly rejected by prior empiricism, with the estimated coefficient for dividends substantially higher than that for book value.

One conjecture concerning this result is that dividends provide information about future earnings and/or their persistence, information relevant to the valuation of companies (Fama and French, 1998 and Giner and Rees, 1999). As pointed out by Fama and French (1998),
such a conjecture could be consistent with either a costly signalling story or one in which measured earnings are noisy and dividends are smoothed with respect to earnings. Because, in the regressions used to examine the relationship between dividends and market value, the coefficient is restricted to be equal for all firms, irrespective of their dividend levels, the coefficient of dividends captures the element of the valuation of earnings varying with dividend levels.

The conjecture is initially supported by the observation that not only is the estimated coefficient of dividends often high in UK results, but also the estimated coefficient for earnings is very low and sometimes statistically indistinguishable from zero in some of the studies referred to above (for example, Akbar and Stark, 2003, Dedman et al., 2009, and Shah et al., 2009), consistent with this coefficient only capturing the impact of transitory earnings only, leaving the coefficient of dividends to effectively capture the effects of persistent earnings. Nonetheless, Jiang and Stark (2009) find that separating firms into those that are profit-making and those that are loss-making results is the disappearance of a low coefficient for earnings for all but loss-making firms. This suggests that the low coefficient on earnings is an artefact of pooling profitable and loss-making firms. Further, the coefficients of dividends for the two groups of firms are much lower than when the coefficient is estimated on a pooled sample. Nonetheless, they remain statistically significant and positive for both sets of firms.

In order to test the conjecture of dividends capturing information about future earnings, and their persistence, more fully, we refine the research design of the previous studies. First, we observe that the definition of dividends used in the studies referred to above aggregates regular and special dividends. Hence, we estimate the impact of separating dividends
between those that are regular and those that are special on the relationships between dividends and market value. Second, prior studies ignore share buybacks as a method of returning assets to shareholders. As a consequence, we investigate the relationship between share buybacks on market value. Third, if the conjecture above is correct, we would expect that the estimated coefficient of regular dividends would exceed those for special and share buybacks, on the grounds that the latter are transitory and, as a consequence, likely to carry less information about future earnings and/or their persistence. Indeed, the coefficients of special dividends and share buybacks might be, when combined with the coefficient of book value, consistent with dividend displacement, if other effects, such as tax effects and/or information effects, are small. Fourth, because prior studies have not separated out profitable from loss-making forms, we investigate the impact of this separation on our results.

Our results suggest the following. First, the coefficients of special dividends and share buybacks are lower than those for regular dividends, consistent with the conjecture above. Second, dividend displacement is clearly rejected for regular dividends. Third, it is impossible to reject the null hypothesis of dividend displacement with respect to special dividends and share buybacks. Fourth, the separation of firms into those that are profitable and those that are loss-making does not affect the general tenor of our results. We interpret these results to suggest that regular dividends carry information concerning future earnings and/or their persistence, whereas special dividends and share buybacks carry relatively little, leading to the rejection of dividend displacement for the former but not for the latter.
2 PRIOR LITERATURE

Miller and Modigliani (1961) prove a theorem that suggests that the size of current dividend payments cannot increase current shareholders’ wealth. This is what is known as ‘dividend irrelevance’. Dividend irrelevance essentially implies the idea of dividend displacement. That is, an extra pound sterling of dividend payments reduces the total market value of the firm by one pound sterling. As a consequence, shareholders’ wealth is unchanged by the increase in dividends. In essence then, all current dividend policies are equivalent and, as a consequence, no particular current dividend policy can increase (or decrease) shareholder’s wealth over an alternative dividend policy.

The dividend irrelevance theorem requires making a number of assumptions: (i) expectations of future firm cash flows are not changed by the level of the current dividends; (ii) investors and managers are symmetrically informed; (iii) perfect capital markets exist; and (iv) there are no taxes. Essentially, assumptions (i) and (ii) do not allow dividends to have information content in the context of the MM analysis.

Dividend irrelevance is built into the theoretical work of Ohlson (1995), amongst others, linking market value with accounting information, as are the underlying assumptions outlined above. One of the outcomes of Ohlson (1995) is that market value can be expressed as a time-invariant linear combination of book value earnings, net shareholder cash flows and ‘other information’. Further, as a consequence of the underlying assumption of dividend irrelevance, and because net shareholder cash flows reduce book value on a one-to-one basis, the coefficients of book value and net shareholder cash flows must be restricted such that the negative of the book value coefficient plus the net shareholder cash
flow coefficient equal minus one.\textsuperscript{1} The modelling in Ohlson (1995) does not separate out components of net shareholder cash flows, but the implication generally is that dividend irrelevance, and the restrictions on coefficients, will apply to any separate components of net shareholder cash flows.

The restrictions identified above are at the heart of the empirical tests in Hand and Landsman (2005). Other studies (Rees, 1997, Akbar and Stark, 2003, Dedman \textit{et al}, 2009, Shah \textit{et al}, 2009) ignore the restrictions, either because testing dividend irrelevance is not the focus of the paper, or because the coefficients of dividends are of such a size relative to the coefficients of book value as to obviate the need for formal statistical tests.

The first paper to note the positive cross-sectional relationship between dividends and market value is Rees (1997). In his research, amongst other models, he regresses market value on dividends, retained earnings and book value, using UK data. This is equivalent to regressing market value on dividends, earnings and book value. Interpreted this way, his results suggest a coefficient for dividends exceeding ten and a coefficient for earnings less than three. Extended regressions including other variables confirm the general size of these coefficient estimates. One motivation for including dividends in the model is that dividends might convey credible signals concerning value from well-informed managers to less well-informed market participants. A further motivation is the differential tax treatment of dividends relative to retained earnings.\textsuperscript{2} Nonetheless, Rees (1997) generally appears to favour a signalling explanation.

\textsuperscript{1} The restriction is derived by differentiating both sides of the market value expressed as a linear combination of book value, earnings and net shareholder cash flows equation by net shareholder cash flows.

\textsuperscript{2} Fama and French (1998) also look for tax effects associated with dividends but suggest that if there are any they are swamped by information effects.
It can be noted that such a signalling argument is difficult to reconcile with analyses such as Ohlson (1995). Essentially, that analysis proceeds by assuming that the vector of book value, earnings, and net shareholder cash flows evolves according to a discrete-time Markov process (known as linear information dynamics – LID). The parameters of the Markov process are assumed to be time-invariant and known by both firm managers and market participants. The linearity of the Markov process ensures that market value can be expressed as a linear combination of the three variables in the vector. To ensure that dividend irrelevance holds, the implied prediction equation for earnings implies that additional pounds sterling of net shareholder cash flows reduce next period’s earnings by the additional amount multiplied by the cost of capital. Expressed equivalently, the size of net shareholder cash flows do not affect next period’s residual income.

In this setting, there is no scope for using dividends, or anything else, to signal the market value, because there is no information asymmetry to bridge via a costly signalling process and, hence, the impact of dividends on market value are completely identified via the dividend displacement property. To introduce costly signalling into an LID framework requires assuming information asymmetry concerning the parameters of the LID between managers and market participants and allowing the level of net shareholder cash flows to carry information useful in helping market participants form rational expectations of these parameters. Outside of costly signalling, another way in which dividends could carry information could be if the parameters of the LID are functions of the level of dividends. As a consequence, the forecasting power of dividends for future earnings and/or residual income could depart from the simple process in identified in the previous paragraph. This could be seen as consistent with a model of dividend setting such as that found in Lintner (1956)
By implication, the results in Rees (1997) appear to reject not only dividend displacement but also the validity of modelling the relationship between market value and accounting items by embedding dividend irrelevance inside a framework which assumes that the accounting items evolve over time in accordance with a Markov process the parameters of which are time invariant. Nonetheless, criticisms can be brought to bear on the analysis of Rees (1997) that could render such conclusions premature.

For example, within the theoretical context of Ohlson (1995), Rees (1997) focuses on dividends, not net shareholder cash flows. As a consequence, new equity raised from shareholders is omitted from any of the regressions estimated, as are share buybacks. Additionally, dividends are not separated into regular and special dividends. Further, an important element of the Ohlson (1995) analysis is the variable ‘other information’, which can be thought of as capturing ‘value relevant events that are yet to have an impact on the financial statements’ (p.668). This variable is also omitted from the study. Finally, Rees (1997) deflates the dependent and independent variables by number of shares, a practice that has attracted criticism (for example, see Lo and Lys, 2000, and Easton and Sommers, 2003, if in the context of the USA).

Subsequent UK literature has addressed some of these issues. The results reported in the valuation study of Stark and Thomas (1998) are consistent with a negative coefficient for net shareholder cash flows, an outcome more consistent with dividend irrelevance. They do not split up net shareholder cash flows into its components, however.
Akbar and Stark (2003) find similar results to Stark and Thomas (1998) by measuring net shareholder cash flows as total dividends less capital contributions, a definition that ignores share buybacks, however. When they split net shareholder cash flows into total dividends and capital contributions and separately include the two components in the regression equation, the positive coefficient on total dividends returns. They do not separate dividends into regular and special components. Further, they use four different deflators (book value, number of shares, opening market value and sales) and find the positive coefficient is robust to deflator choice (unlike in the US, as pointed out by Lo and Lys, 2000). Finally, Akbar and Stark (2003) also develop a proxy for ‘other information’ and include it in their estimation equations. Its inclusion does not alter conclusions with respect to the size and sign of the coefficient on dividends, although it does substantially increase the explanatory power of the estimated equations.

Dedman et al (2009) and Shah et al (2009) either update or expand upon the analysis of Akbar and Stark (2003), but provide similar results on the coefficient of dividends. As with Akbar and Stark (2003), neither study considers share buybacks or partitions dividends into regular and special components. The foci of these studies, however, is not dividend displacement per se.

Hand and Landsman (1999) perform a more formal and comprehensive analysis with respect to Ohlson (1995) and dividend displacement in the USA. In general, their findings are broadly consistent with those in the UK, although some of their conclusions could be related to estimation methods (Lo and Lys, 2000). They conclude that one explanation consistent with the positive coefficient on dividends is that it is a result of mispricing of
book value and earnings. As they observe, this involves swapping one puzzle for another. Additionally, they do not include share buybacks or special dividends in their analyses.

Given the above, it is clear that *none* of the prior studies consider the impact of special dividends and share buybacks on market value. Previous studies have explicitly ignored share buybacks. Further, they have not split total dividends into regular and special dividends. Here, although levels of regular dividends might be set according to Lintner-type (1956) processes, it would not necessarily be the case that the same applied to special dividends and share buybacks. Further, special dividends, by their very nomenclature, are not regular. As a consequence, they can be thought of as transitory events with likely different forecasting properties for the level of future earnings and/or their persistence. Similarly, share buybacks, although more common than special dividends, only take place for a small minority of firms each year. Again, they can also be thought of as transitory events.

As a consequence, given the likely differential forecasting relevance for regular dividends, special dividends and share buybacks, we might speculate that they will have different coefficients in estimated linear valuation models. In particular, if the positive coefficient on dividends is caused by its forecasting ability for future earnings in which higher dividends forecast higher and/or more persistent earnings, it would be expected that the coefficients of special dividends and share buybacks would be smaller than that for regular dividends.

Further, if they have only limited forecasting ability for the level and/or persistence of future earnings, it might be impossible to reject dividend displacement for these methods of returning resources to shareholders. This is not to deny that there could be tax effects
associated with dividend payments and share buybacks, as considered by Rees (1997) and Fama and French (1998). Nonetheless, in those studies, if tax effects exist then they are swamped with other effects and are reduced to a second-order issue.

Further, it is not to deny either that special dividends and share buybacks have some informational properties with respect to future earnings. For example, they might well suggest the limited availability of profitable projects and that the management of the company are not going to waste shareholders’ resources in pursuing projects that destroy shareholder wealth. Again, however, it is assumed that these effects are second-order and will be dominated by dividend displacement effects.

3 Research Methodology

This basic research strategy of the paper is to merge the empirical models used by Rees (1997) and Akbar and Stark (2003) in order to test the relationship between the various types of net asset distribution - regular dividends, special dividends, and share buybacks – and market value. The basic significant variables included by Rees (1997) in his model of market value are book value, total (regular plus special) dividends, earnings and capital expenditures. Those included by Akbar and Stark (2003) are book value, earnings, net shareholder cash flows (equal to total dividends less capital contributions by shareholders), and research and development expenditures. They also split net shareholder cash flows into total dividends and capital contributions in their regressions.

The approach used is to estimate a series of models using market value as the dependent variable and earnings, book value, research and development expense, and capital
expenditures as control variables. The first model adds net shareholder cash flows to the
control variables. Here, net shareholder cash flows are the sum of regular dividends, special
dividends and share buybacks (gross shareholder cash flows) net of capital contributions.
The second model partitions net shareholder cash flows into gross shareholder cash flows
and capital contributions. The third model splits gross shareholder cash flows into total
dividends and share buybacks. The final model splits total dividends into regular and
special dividends.

The four models estimated are, therefore:

\[ MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 CE + \alpha_4 R & D + \alpha_5 NSCF + \varepsilon \] (1)

\[ MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 CE + \alpha_4 R & D + \alpha_5 GSCF + \alpha_5 CC + \varepsilon \] (2)

\[ MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 CE + \alpha_4 R & D + \alpha_5 TD + \alpha_5 SB + \alpha_5 CC + \varepsilon \] (3)

\[ MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 CE + \alpha_4 R & D + \alpha_5 RD + \alpha_5 SD + \alpha_5 SB + \alpha_5 CC + \varepsilon \] (4)

where:

\[ NSCF_i = RD_i + SD_i + SB_i - CC_i \] (5)

\[ GSCF_i = RD_i + SD_i + SB_i \] (6)

\[ TD_i = RD_i + SD_i \] (7)

and

\[ MV_t = \text{market value of the firm at time } t; \]
To test for whether the coefficients of the components of net shareholder cash flows are different, we use F-tests to successively test for differences in explanatory power between models one and two, two and three, and three and four. The underlying null hypothesis of the tests is that the coefficients of the components are equal (in absolute size where necessary). Effectively, we test for whether the coefficients involved for each successive partition (e.g., net shareholder cash flows into gross shareholder cash flows and capital contributions, gross shareholder cash flows into total dividends and share buybacks, etc.) are different. Expressed algebraically, the tests involve the null hypotheses that:

\[ \alpha_{s1} = -\alpha_{s2} \]  

when comparing Model 2 with Model 1, \(^3\)

\[ \alpha_{s11} = \alpha_{s12} \]  

when comparing Model 3 with Model 2, and

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\(^3\) Equation (8) is expressed with a negative sign in front of the coefficient of capital contributions because both cash inflows and outflows are treated as having positive signs.
\[ \alpha_{5111} = \alpha_{5112} \]  \hspace{1cm} (10)

when comparing Model 4 with Model 3.

To test for dividend displacement with respect to the various measures associated with transfers to and from shareholders, using F-tests again, we test the following restrictions on the estimated coefficients in equation (4):

\[-\alpha_0 + \alpha_{5111} = -1 \]  \hspace{1cm} (11)
\[-\alpha_0 + \alpha_{5112} = -1 \]  \hspace{1cm} (12)
\[-\alpha_0 + \alpha_{512} = -1 \]  \hspace{1cm} (13)

The models are estimated with equations (1) to (4) deflated by book value.

4 DATA AND SAMPLE

The sample for this study consists of all UK non-financial firms listed on the London Stock Exchange from 1992 to 2006. Although Akbar and Stark (2003) start their sample at 1990, this study starts the sample period at 1992 because of data availability with respect to our measure of dividends. The data includes both ‘live’ and ‘dead’ firms to avoid as much as possible survivorship bias. Accounting and market data are collected from Datastream.

Annual cross-sections are constructed for each of calendar years 1992-2007. Based on Akbar and Stark (2003), to be included in an annual cross-section, a firm-year observation
must meet the criteria that:

(i) the financial year for that firm must end during the calendar year for the annual cross-section;
(ii) firms must not have an irregular length fiscal years – those that are over a seven day tolerance around one year are excluded;
(iii) the firm must have only a single code in Datastream, suggesting that the firm has only a single listed security; and they must be available for that calendar year;
(iv) the firm must not have (unlisted) preference shares in excess of total shareholders’ equity;
(v) the firm must not be classified as either financial or unclassified using the industry classification in Datastream;
(vi) the currency of the firm’s financial statements is pound sterling;
(vii) all accounting and market data must be available; and
(viii) closing book value must be positive because of its role as a deflator

After retrieving data, there are 17708 firm-year observations for the period from 1992-2007 with between 947 and 1313 firm-years in each annual cross-section.

The definitions for the variables used in this paper are as follows.

(i) market value (MV_t) – the market value for year t, is measured six months after its balance sheet date during that calendar year. For a firm whose financial year ends on December 31, 1992, its market value will be measured on June 30, 1993, or the nearest trading day. The reason for measuring market value six months after the balance sheet
date is that all UK listed firms have six months to prepare and release their annual accounts. (Datastream item MV);

(ii) book value (BV<sub>t</sub>) - book value for year <i>t</i> is measured as the sum of preferred stock and common shareholders’ equity for the financial year ending in year <i>t</i>. (Worldscope item - WC03995 - total shareholder’s equity);

(iii) earnings (E<sub>t</sub>) - earnings represents income after all operating and non-operating income and expense, reserves, income taxes, minority interest and extraordinary items for the financial year ending in year <i>t</i>. (Worldscope item - WC01651 - Net income before preferred dividends);

(iv) capital expenditures (CE<sub>t</sub>) - capital expenditures for year <i>t</i> are measured as funds used to acquire fixed assets other than those associated with acquisitions at year <i>t</i>. (Worldscope item - WC04601 - Capital Expenditures – Additions to Fixed Assets);

(v) research and development expense (R&D<sub>t</sub>) - research and development expenditures for year <i>t</i> are measured as all costs which are recognised in the income statement at year <i>t</i>. They relate to the creation and development of new processes, applications and products with commercial possibilities (Worldscope item -WC01201-Research and Development Expense);

(vi) dividends declared (TD<sub>t</sub>) - dividends declared at year <i>t</i> represents the total value of the common dividends declared for the year <i>t</i>. For most countries outside of the U.S. and Canada it includes the interim paid, if any, plus the proposed final dividend declared after the year end. If not reported separately, it is the dividend charged to retained earnings. Dividends declared combines between regular and special dividends  Data for this variable is generally not available prior to 1992 (Worldscope item –WC18192 - Dividends Provided for or Paid);
(vii) regular dividends \((R_{D_t})\) and special dividends \((S_{D_t})\) - regular dividends represent the dividends that are usually distributed to shareholders declared in each quarter, or each half-year. Special dividends are irregular payments made to shareholders with no implication that they will be repeated. The Worldscope database only provides per share data for regular and special dividends. To partition total dividends into regular and special dividends, I estimate \(R_{D}\) and \(S_{D}\) by splitting total dividends on a pro rata basis between regular and special dividends on a pro rata basis. Hence:

\[
RD = \frac{TD \times \text{total regular dividends per share for the year}}{\text{total regular and special dividends per share for the year}} \quad (11)
\]

and

\[
SD = \frac{TD \times \text{total special dividends per share for the year}}{\text{total regular and special dividends per share for the year}} \quad (12)
\]

Dividends per share are estimated using data on quarterly dividends for regular and extra dividends (Worldscope item - WC05121-WC05124 – Dividends per Share – Quarter and Worldscope item - WC05151-WC05154 - Dividends per Share – Extra – Quarter) and special dividends (Worldscope item - WC05155-WC05158 - Dividends per Share – Special – Quarter). Extra dividends are classified as regular dividends;

(viii) share buybacks \((S_{B_t})\) – share buybacks for year \(t\) represents funds used to decrease the outstanding shares of common stock. (Worldscope item - WC04751 – Common/Preferred Redeemed, Retired, Converted etc). It is assumed that the buying back of preference shares is small; and

(ix) capital contributions \((C_{C_t})\) - capital contributions for year \(t\) are measured as the
amount the firms receives from the sale of common and/or preferred stock at year $t$.

(Worldscope item - WC04251 - Net Proceeds from Sales/Issue of Common and
Preferred). Again, it is assumed that amounts of preference shares issued will be small.

Having generated an initial sample, the sample is treated to eliminate extreme observations. This is standard practice in much market-based accounting research. We follow the basic strategy of Akbar and Stark (2003) in particular in deleting extreme observations. This should aid comparability with previous UK work concerning the relationship between dividends and market value.

For each annual cross-section, we construct the deflated variables, using book value as the deflator. For each annual cross-section, a firm-year is deleted from it if one or more of the deflated variables are in the top or bottom 1% of values for that variable, other than for capital expenditures, research and development expense, total dividends and buybacks, for which the deletion rule only covers the top 1% of the observations.

Table 1 shows how many firms are left in each annual cross-section after the deletion of extreme observations.
Table 1

<table>
<thead>
<tr>
<th>Year</th>
<th>Before trimming</th>
<th>After trimming</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>947</td>
<td>873</td>
</tr>
<tr>
<td>1993</td>
<td>872</td>
<td>808</td>
</tr>
<tr>
<td>1994</td>
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<td>829</td>
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<tr>
<td>1995</td>
<td>952</td>
<td>878</td>
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<td>1996</td>
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<td>1027</td>
</tr>
<tr>
<td>1997</td>
<td>1197</td>
<td>1094</td>
</tr>
<tr>
<td>1998</td>
<td>1157</td>
<td>1059</td>
</tr>
<tr>
<td>1999</td>
<td>1095</td>
<td>1005</td>
</tr>
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<td>1055</td>
</tr>
<tr>
<td>2002</td>
<td>1107</td>
<td>1010</td>
</tr>
<tr>
<td>2003</td>
<td>1036</td>
<td>956</td>
</tr>
<tr>
<td>2004</td>
<td>1132</td>
<td>1049</td>
</tr>
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<td>2005</td>
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<td>1191</td>
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<td>2006</td>
<td>1313</td>
<td>1200</td>
</tr>
<tr>
<td>2007</td>
<td>1289</td>
<td>1180</td>
</tr>
<tr>
<td>Pooled</td>
<td>19734</td>
<td>16247</td>
</tr>
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</table>

Table 2 provides information of the characteristics of the sample for the deflated variables used in the regression models for the trimmed samples. In general, all variables indicate a degree of skewness. Table 3 provides correlations between the deflated variables in the regression equations. Generally, there are no correlations between variables included in the same model that suggest that multicollinearity could cause estimation difficulties.4

4 No statistics are provided for book value because it is also the deflator for the estimated equation. As a consequence, deflated book value is identically equal to one.
### Table 2

Sample Statistics for Annually Trimmed Data from 1992-2007

<table>
<thead>
<tr>
<th>Deflated Variable</th>
<th>Mean</th>
<th>Median</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
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<tbody>
<tr>
<td>E</td>
<td>-0.018</td>
<td>0.087</td>
<td>0.520</td>
<td>-11.576</td>
<td>1.706</td>
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<tr>
<td>CE</td>
<td>0.136</td>
<td>0.087</td>
<td>0.167</td>
<td>0.000</td>
<td>1.922</td>
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<tr>
<td>RD</td>
<td>0.032</td>
<td>0.000</td>
<td>0.097</td>
<td>0.000</td>
<td>1.418</td>
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<tr>
<td>NSCF</td>
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<td>0.004</td>
<td>0.343</td>
<td>-4.333</td>
<td>1.281</td>
</tr>
<tr>
<td>GROSSNSCF</td>
<td>0.050</td>
<td>0.028</td>
<td>0.081</td>
<td>0.000</td>
<td>1.342</td>
</tr>
<tr>
<td>DECDIV</td>
<td>0.046</td>
<td>0.031</td>
<td>0.060</td>
<td>0.000</td>
<td>0.729</td>
</tr>
<tr>
<td>REGDIV</td>
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<td>0.058</td>
<td>0.000</td>
<td>0.707</td>
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<tr>
<td>SPECDIV</td>
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<td>0.000</td>
<td>0.015</td>
<td>0.000</td>
<td>0.698</td>
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<tr>
<td>BUYBACK</td>
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<td>0.000</td>
<td>0.051</td>
<td>0.000</td>
<td>1.342</td>
</tr>
<tr>
<td>CC</td>
<td>0.137</td>
<td>0.003</td>
<td>0.330</td>
<td>0.000</td>
<td>4.333</td>
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### Table 3

Correlations Between the Independent Variables

<table>
<thead>
<tr>
<th></th>
<th>E</th>
<th>CE</th>
<th>R&amp;D</th>
<th>NSCF</th>
<th>GSCF</th>
<th>TD</th>
<th>RD</th>
<th>SD</th>
<th>CC</th>
<th>SB</th>
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<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>CE</td>
<td>0.038</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>R&amp;D</td>
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<td>-0.0659</td>
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<td></td>
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<tr>
<td>NSCF</td>
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<td>0.053</td>
<td>-0.1403</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>GSCF</td>
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<td>0.1456</td>
<td>-0.0496</td>
<td>0.3576</td>
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<tr>
<td>TD</td>
<td>0.314</td>
<td>0.1874</td>
<td>-0.0583</td>
<td>0.3376</td>
<td>0.7774</td>
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<td>RD</td>
<td>0.3182</td>
<td>0.1922</td>
<td>-0.0578</td>
<td>0.3337</td>
<td>0.7535</td>
<td>0.9664</td>
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<td>SD</td>
<td>0.0335</td>
<td>0.013</td>
<td>-0.0105</td>
<td>0.0681</td>
<td>0.2136</td>
<td>0.2853</td>
<td>0.0345</td>
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<td>CC</td>
<td>-0.2568</td>
<td>-0.0204</td>
<td>0.1367</td>
<td>-0.9732</td>
<td>-0.1339</td>
<td>-0.168</td>
<td>-0.1686</td>
<td>-0.024</td>
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<td>SB</td>
<td>0.0243</td>
<td>0.0109</td>
<td>-0.0102</td>
<td>0.1708</td>
<td>0.6735</td>
<td>0.0586</td>
<td>0.0601</td>
<td>0.0036</td>
<td>-0.0151</td>
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</table>
Table 3 provides the correlations between variables. The result suggests that extreme multicollinearity problems are unlikely to exist in the estimated regressions, as we do not find substantially large correlations between variables.

5 RESULTS

Table 4 reports the regression results from estimating Models 1 through 4 on the pooled sample of annually trimmed data trimmed for the period from 1992-2007. The regressions are estimated with time fixed effects. The coefficients of the constant term and those for the added time dummies are not reported, for reasons of space. Table 5 provides the results of the F-tests performed on the restrictions on the various model coefficients identified above in equations (8) through (13).

With respect to the control variables, the results largely confirm those found in prior UK studies (e.g., Rees, 1997, Akbar and Stark, 2003, Dedman et al, 2009, Shah et al, 2009). The coefficient of book value is positive and significant. The coefficient of earnings is relatively small and positive but, in our case, is strongly significant. The coefficient of capital expenditures is positive and significant, as is that for research and development expense. The sizes of these coefficients are similar to those found in previous studies.

As the model estimates move from Model 1 to Model 4, it can be noted that the coefficients of book value, earnings and capital expenditures all reduce, even if they stay highly significant. This suggests that they capture some of the information that is revealed as net shareholder cash flows are successively disaggregated.
### TABLE 4

Estimating Models of Valuation on Trimmed Data for 1992-2007 (Estimated with Year Dummies) - 16247 Firm-year Observations in Total

**Model 1**

\[ MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 CE + \alpha_4 R & D + \alpha_5 NSCF + \varepsilon \]

**Model 2**

\[ MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 CE + \alpha_4 R & D + \alpha_{51} GSCF + \alpha_{52} CC + \varepsilon \]

**Model 3**

\[ MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 CE + \alpha_4 R & D + \alpha_{511} TD + \alpha_{512} SB + \alpha_{52} CC + \varepsilon \]

**Model 4**

\[ MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 CE + \alpha_4 R & D + \alpha_{5111} RD + \alpha_{5112} SD + \alpha_{512} SB + \alpha_{52} CC + \varepsilon \]

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-Square</td>
<td>0.191</td>
<td>0.210</td>
<td>0.218</td>
<td>0.219</td>
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<tr>
<td>BV</td>
<td>1.701</td>
<td>0.059</td>
<td>28.850</td>
<td>0.000</td>
</tr>
<tr>
<td>E</td>
<td>1.324</td>
<td>0.088</td>
<td>15.060</td>
<td>0.000</td>
</tr>
<tr>
<td>CE</td>
<td>4.409</td>
<td>0.247</td>
<td>17.870</td>
<td>0.000</td>
</tr>
<tr>
<td>RD</td>
<td>8.914</td>
<td>0.434</td>
<td>20.530</td>
<td>0.000</td>
</tr>
<tr>
<td>NSCF</td>
<td>-1.372</td>
<td>0.126</td>
<td>-10.880</td>
<td>0.000</td>
</tr>
<tr>
<td>GSCF</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TD</td>
<td></td>
<td></td>
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<tr>
<td>RD</td>
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<td>SD</td>
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<td>SB</td>
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<td></td>
</tr>
<tr>
<td>CC</td>
<td></td>
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</tr>
</tbody>
</table>

Note: The table shows the coefficients (Coef.), standard errors (Std. Err.), t-statistics (t), and p-values (P>t) for each model.
Turning to the variables of interest, Model 1 reveals that the coefficient of net shareholder cash flows is negative and significant. This result is consistent with the results in Stark and Thomas (1998). Further, and although they use a definition of net shareholder cash flows which ignores share buybacks, it is consistent with the results in Akbar and Stark (2003). One possible interpretation of these results is that they are dominated by the effects of capital contributions. Note from Table 3 that net shareholder cash flows have a correlation higher in absolute value than .97 with capital contributions. This suggests that, even though the raising of new equity is a relatively rare event, the size of such activities dominates in estimating the regression coefficient.

Model 2 disaggregates net shareholder cash flows into gross shareholder cash flows (total dividends plus share buybacks) and capital contributions. The coefficient for gross shareholder cash flows is positive and significant, as is the coefficient for capital contributions. This suggests that outflows of resources to shareholders have different valuation impacts relative to inflows of resources. Issuing new capital has a strictly positive effect on market value, presumably because markets expect that the resources will not be totally wasted. In fact, the results for Models 2, 3 and 4 suggest that the market value impact of capital contributions is at least three times their size.\(^5\) Whether such an effect is economically plausible or is a result of model misspecification is left to future research. The impact of gross shareholder cash flows is consistent with the idea that some or all of its components have information content with respect to the level and/or persistence of future earnings. The result of the F-test for Model 2 reported in Table 5 suggests that the null hypothesis that the coefficients

\(^5\) The impact of capital contributions comes through both through itself and a one-to-one positive relationship with book value. Hence, the overall effect is captured by the sum of the coefficients for book value and capital contributions. This sum exceeds three for Models 2 through 4.
of gross shareholder cash flows and capital contributions are equal in absolute size but opposite in sign, as expressed in equation (8), can be rejected.

<table>
<thead>
<tr>
<th>Model</th>
<th>Restriction</th>
<th>F-statistic</th>
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<tbody>
<tr>
<td>2</td>
<td>$\alpha_{51} = -\alpha_{52}$</td>
<td>390.222*</td>
</tr>
<tr>
<td>3</td>
<td>$\alpha_{511} = \alpha_{512}$</td>
<td>165.974*</td>
</tr>
<tr>
<td>4</td>
<td>$\alpha_{511} = \alpha_{512}$</td>
<td>20.772*</td>
</tr>
<tr>
<td>4</td>
<td>$-\alpha_0 + \alpha_{5111} = -1$</td>
<td>371.33*</td>
</tr>
<tr>
<td>4</td>
<td>$-\alpha_0 + \alpha_{5112} = -1$</td>
<td>0.12</td>
</tr>
<tr>
<td>4</td>
<td>$-\alpha_0 + \alpha_{512} = -1$</td>
<td>0.54</td>
</tr>
</tbody>
</table>

Note: * implies statistical significance at the 5% level or better

The results for Model 3 provide the outcomes of disaggregating gross shareholder cash flows into total dividends and share buybacks. First, this disaggregation little affects the size of the coefficient of capital contributions. Second, and more importantly, the coefficient of share buybacks is positive, although insignificantly different from zero, but much lower than the coefficient for total dividends. Further, the coefficient of total dividends is higher than that for gross shareholder cash flows. The null hypothesis that the coefficients of total dividends and share buybacks are equal, as identified in equation (9), can be rejected using the F-statistic reported for
Model 3 in Table 5. The outcome is consistent with the idea that share buybacks have less information about the level and/or persistence of future earnings than total dividends that includes, in particular, regular dividends. Further, it suggests that some of the information content of total dividends is suppressed when it is aggregated with share buybacks.

The results for Model 4 provide the outcomes of the final disaggregation considered – splitting total dividends into regular and special dividends. This disaggregation has little effect on the coefficients of capital contributions – their sizes are similar to those estimated in Models 2 and 3, and remain positive and significant and positive but insignificant respectively. The coefficient of special dividends is negative but insignificantly different from zero. The coefficient of regular dividends is positive and significant, and higher than that for total dividends. The null hypothesis that the coefficients of regular and special dividends are equal, as identified in equation (10), can be rejected using the first F-statistic for Model 4 reported in Table 5. The overall outcome is consistent with the idea that special dividends have less information about the level and/or persistence of future earnings than regular dividends. It also suggests that some of the information content of regular dividends is suppressed when it is aggregated with special dividends and share buybacks.

We also perform tests for dividend displacement effects for regular dividends, special dividends and share buybacks. The null hypotheses for these tests were expressed in equations (11), (12) and (13). The results in Table 5 cannot reject the null hypothesis of dividend displacement for special dividends and share buybacks (the bottom two rows of the table). The null hypothesis of dividend displacement can be rejected for
regular dividends (the second F-statistic reported for Model 4). With respect to special dividends and share buybacks, the results suggest that even if these ways of transferring resources to shareholders have a degree of information content and/or have tax implications, these effects are swamped by dividend displacement effects. For regular dividends, the results suggest that the information effects potentially identified in prior studies with respect to total dividends are driven by regular dividends.

6 ROBUSTNESS CHECKS

Following Jiang and Stark (2009), we re-estimate Models 1 to 4 on profit-making and loss-making firms separately. We do so by taking the full trimmed sample and splitting it into those firms that make losses and those that make profits. The results with respect to the coefficients of earnings and book value are consistent with Jiang and Stark (2009). In untabulated regressions, we find that the coefficient of earnings is high for profitable firms, higher than that for gross shareholder cash flows, total dividends and regular dividends, and higher than that for loss-making firms. The coefficient of earnings for loss-making firms is low and around zero. The coefficient of book value is low for profitable firms and high for loss-making firms.

With respect to the variables of interest to this study, we find that the coefficient of regular dividends is positive and significant for both sub-samples of firms, and higher than those for special dividends and share buybacks. It is significantly higher than for share buybacks, however, for both sub-samples, but only higher than for special dividends for the profit firm sub-sample.
In general, the coefficients for gross shareholder cash flows, total dividends and regular dividends are lower in both sub-samples than they are in the pooled sample. With respect to Jiang and Stark (2009), this is similar to their results for total dividends. Further, dividend displacement cannot be rejected on either sample for special dividends and share buybacks, but is rejected for regular dividends.

Finally, we estimate the models on each annual cross-section separately, and aggregate the various estimates across the years using the Fama and MacBeth (1973) approach. The results are unchanged. We place greater weight on the results from the pooled regressions with time fixed effects because the number of special dividends in particular are small across all the years. As a consequence, their representation in any particular annual cross section could be very small, especially in the later years of the sample period. The same applies to share buybacks, although to a lesser extent, with relatively small numbers in the earlier years of the sample period. We believe the small numbers of non-zero observations in some years could make the results unreliable.

7 CONCLUSIONS

In this paper, we provide a test of a conjecture due to Fama and French (1998) and Giner and Rees (1999). The conjecture concerns the reason for the empirical results in both the UK and the US that dividends have a positive relationship with market value, even after controlling for other value relevant variables. The conjecture is that components of dividends (in particular, regular dividends) potentially are informative
about the future levels and persistence of earnings. Models that suggest this is so include, for example, Lintner (1956). Nonetheless, regular dividends are not the only ways in which firms return resources to shareholders. Firms also occasionally pay special dividends and engage in share buybacks, and these means of distributing resources to shareholders have been ignored in previous studies. Because of the transitory nature of these two other ways of returning resources to shareholders, we argue that they are likely to be less informative about the level and persistence of future earnings than regular dividends. As a consequence, they will have lower coefficients in estimated regressions with market value as the dependent variable than regular dividends. Further, if their informational value with respect to future earnings are slight, and tax effects are not large, it could be the case that dividend displacement cannot be rejected for special dividends and share buybacks, whereas it can for regular dividends.

Our results are consistent with the conjecture. The coefficient of regular dividends is significantly positive and significantly higher than those for special dividends and share buybacks. Further dividend displacement can be rejected for regular dividends but not for special dividends and special dividends. This appears to be consistent with the conjecture concerning the informational role of dividends made above and also suggests that dividend displacement effects swamp out any tax benefits for, or informational benefits of, special dividends and share buybacks. The results are not changed when the sample of firms are split into profitable and loss-making firms.

There is a particular caveat that can be added to our conclusions, however. If the conjecture we argue is supported by our results is correct, it is possible (or even
probable) that the relationship between market value, book value, earnings, dividends, capital contributions and the other control variables is not linear. In particular, the arguments put forward suggest that the true valuation coefficient of earnings could be locally positive function of dividends, suggesting a non-linear relationship between market value, earnings and dividends specifically. This suggests that devising tests that can exploit the potentially non-linear relationship could help in separating out informational roles for regular dividends in particular from dividend displacement (and tax) effects. But, the possibility of a non-linear relationship leaves the possibility of mis-specification problems driving our results. We view this as unlikely, but it is a possibility.
REFERENCES


