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Do UK firms manage earnings to meet dividend thresholds?

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This paper examines earnings management by dividend-paying firms in cases where pre-managed earnings would fall below the expected dividend, and by non-dividend paying firms aiming to avoid reporting losses. We find that within the UK market the likelihood of upward earnings management is significantly greater in the former case than the latter, though both are drivers for earnings management. Large firms are less likely to upwardly manage earnings to reach dividend thresholds, consistent with prior UK evidence on the ability of the largest firms to avoid restrictive debt covenants. We also find that earnings management is more clearly observable through examining working capital discretionary accruals than through examining total discretionary accruals.

Keywords: accruals; debt covenants; dividend payments; dividend thresholds; earnings management; loss-avoidance

1. Introduction

A large-scale empirical study of US firms by Daniel, Denis and Naveen (2008) (DDN hereafter) reports that dividend-paying firms use accruals to manage earnings upwards in cases where pre-managed earnings (earnings minus the discretionary component of accruals) would show a deficit relative to the expected dividend (proxied by the previous year's dividend). They link this behaviour to the existence of dividend restrictions within debt covenants, citing research by Bradley and Roberts (2004) which shows that US debt contracts often include restrictions on dividend payments relative to the level of a firm's earnings. With regard to those firms that do not pay dividends (non-payers) DDN find that deficits between reported earnings and the expected dividend (zero) play no significant role in determining the magnitude of discretionary accruals. This suggests that loss avoidance is not a significant driver for earnings management by non-paying firms. Our paper examines these issues within a UK context.

Historically, dividend payments have been much more prevalent among UK firms than among US firms, due partly to the more favourable tax treatment of dividends in the UK prior to the

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Finance Act 1997, but due also to a suggested desire to cater for the dividend preferences of UK institutional investors (Ferris *et al.* 2006). With regard to UK dividend-paying firms our findings are similar to those of DDN in that such firms use accruals to manage earnings upwards in cases where pre-managed earnings would show a deficit relative to the expected dividend. However, unlike DDN, we find that loss avoidance by non-paying firms also plays a role in earnings management. In several developments of the DDN methodology we identify that large firms appear to be less likely to upwardly manage earnings to reach dividend thresholds, and that earnings management is more clearly observed through working capital discretionary accruals than total discretionary accruals.

The remainder of the paper is structured as follows. Section 2 discusses dividend-paying behaviour within the UK context and the likelihood of dividend thresholds existing for UK firms. Section 3 presents the data and methodology for our study. Section 4 presents the results of both tabular and logit regression analysis, based partly on DDN but also including extensions to their original methodology. Section 5 discusses the results and section 6 concludes.

2. Dividend thresholds within the UK context

Before we begin an empirical analysis based on DDN's study of US firms, we first need to address the question of whether the same underlying factors apply to the UK. Do we have any reason to expect UK dividend-paying firms to manage earnings in order to achieve dividend thresholds? One possible rationale for this behaviour would be the existence of dividend restrictions within debt covenants. DDN hypothesise that this may explain their findings, although they are careful to note that their results are indicative but not conclusive. Of course, the notion of dividend thresholds for reported earnings numbers presupposes that firms are keen to maintain dividend payments to shareholders, and that the maintenance of dividends may sometimes require firms to manage reported earnings numbers.

While recent decades have seen a growing trend among US firms to engage in share repurchases in place of dividend payments to shareholders (Skinner 2008, p. 583), evidence from the UK suggests a rather different picture. A survey by Trojanowski and Renneboog (2005, pp. 22–23) reports that five out of six UK firms paid dividends during the 1990s. They contrast this with the evidence on US firms for the same period during which less than one in four paid dividends. With regard to UK repurchases, they note that less than 6% of firms repurchased shares, contrasting with evidence that the proportion of repurchasing US firms reached 84% by the end of the 1990s (Grullon and Michaely 2002, p. 1651). The relatively low level of repurchase activity in the UK market is also noted by Rau and Vermaelen (2002), and by Ferris *et al.* (2006, p. 1150) who describe share repurchases among UK firms as 'uncommon'.[1]

The popularity of dividends within the UK is reaffirmed by Benito and Young (2001, p.20), who examine UK data from 1974–1999 and report that dividends, once initiated, exhibit 'nominal stickiness'. Even following changes to the tax treatment of dividends in the Finance Act 1997, which led some scholars to suggest that UK dividends were now less highly valued by institutional investors (Bell and Jenkinson 2002), dividend payments remained much more prevalent among UK firms than among US firms (Ferris *et al.* 2006, p. 1171). Given the relative popularity of dividend payments among UK firms the next question to ask is whether dividend payments are associated with earnings management and, more specifically, the existence of dividend thresholds for reported earnings numbers.

Evidence from the US market (Bradley and Roberts 2004) shows that many companies face restrictions on dividend payments imposed by debt covenants, such as a ceiling on funds available for dividends in relation to the level of earnings. In such cases, a company's keenness to avoid cutting dividends may induce some degree of earnings management to circumvent these dividend

restrictions. With regard to the UK market, Ball *et al.* (2000, p. 29) note that most corporate debt is in the form of private debt/bank lending. Thus, debt contracts are made directly between a single large lender (bank) and borrower (firm) so there is the opportunity to tailor debt covenants to reflect firm or industry characteristics (Dichev and Skinner 2002). However, UK evidence suggests very little tailoring of covenants (Day and Taylor 1997).

Several prior research papers provide a rationale for the management of reported earnings by covenanter firms due to the frequent appearance of earnings-based financial ratios in UK debt covenants. Chatterjee (2006) examines the relatively new phenomenon of performance-pricing in debt covenants, in which the terms of the contract can respond quickly to changes in a firm's performance. Of 64 contracts examined, the dominant trigger for changes in the terms of the debt contract is the ratio of debt-to-earnings, which appears in over 41% of covenants. This confirms a similar finding for US debt covenants (Asquith *et al.* 2005) and leads Chatterjee (2006, p. 14) to suggest that companies may have an incentive to engage in 'creative accounting' with regard to earnings in order to avoid breaking earnings-based covenant restrictions. Moir and Sudarsanam (2007, p. 156) survey private debt contracts for 72 of the 200 largest non-financial UK firms and report that the most frequent financial covenant metrics include the interest coverage ratio and debt-to-earnings. This reaffirms the evidence from Chatterjee (2006) of an important role for earnings numbers in covenant ratios.

These studies provide a rationale for linking the existence of debt covenants with earnings management. Direct evidence that reported earnings levels may limit or determine dividend payments is provided in Barker's (1999) survey of 40 leading finance directors:

> 'The finance directors variously mentioned a number of important variables that are partial determinants of dividend policy. These included the average dividend cover for the sector and also the 'traditional' level of cover for the company itself … though earnings cover was almost universally considered more important than cash cover.' (Barker 1999, p. 212)

If UK firms feel pressured into maintaining existing dividend coverage ratios then there will be an increased likelihood of earnings management when firms wish to maintain dividend payments at times of weak earnings performance. However, whilst a concern for coverage ratios could be the result of dividend restrictions in UK debt covenants, Barker (1999) does not provide any empirical analysis of this issue. Some insight on this issue is provided by Moir and Sudarsanam (2007), who report that 55 of the 72 firms in their UK study have covenants attached to their debt contracts while the remaining 17 firms have debt contracts with no covenants. Dividend payout ratios are significantly lower for those firms with financial covenants. Indeed, it has long been recognised that lending institutions will consider imposing restrictions on dividend payments if a firm's financial position appears inadequate to justify such payments. Citron (1992) examines financial covenants in UK bank loan contracts by analysis of questionnaires completed by 33 lending bankers. In cases where a breach of the debt contract was considered to be imminent, lenders 'were more likely to impose certain costly contract modifications, such as additional security and dividend and capital spending restrictions, than to permit relaxation of existing covenant constraints'. (Citron 1992, p. 329)

The evidence of these studies suggests the following: (a) dividend payments remain popular with UK firms and, once initiated, tend to be sticky; (b) concern for coverage ratios provides a rationale for the management of earnings by dividend-paying firms at times of poor performance; (c) debt contracts can lead to the threat of dividend restrictions being imposed by lenders, and the existence of covenants is statistically associated with lower (more constrained) dividend payments. These findings are all consistent with the conditions in which UK firms may manage earnings to attain dividend thresholds because of debt covenants. Section 3 describes the data sample

used in this study and also explains the test methodologies used to explore the association between earnings management and dividend payments by UK firms.

3. Data and methodology

3.1. *Data*

The data for this study are extracted from *Datastream* for firms listed on the London Stock Exchange between 1994 and 2004 as members of FTSE-100 index (15%), the FTSE Mid-250 index (37.4%) and the FTSE Small Cap index (47.6%). We include dead firms across the test period to avoid survivorship bias and exclude financial/property firms, and utilities.

Our primary estimation method for total discretionary accruals (TDA) follows the cross-sectional approach suggested by Dechow *et al.* (1995). This process estimates discretionary (or abnormal) accruals as the residual from a regression of total accruals onto the reciprocal of lagged total assets, the change in revenues minus the change in accounts receivable, and the level of plant, property and equipment. The regression is estimated separately for each sector-year with all variables deflated by lagged total assets.

$$\mathrm{TDA_t} = \mathrm{TACC_{t-1}} - [\alpha_1.1/\mathrm{TA_{t-1}} + \alpha_2.(\Delta\mathrm{REV_t} - \Delta\mathrm{AR_t})/\mathrm{TA_{t-1}} + \alpha_3.\mathrm{PPE_t}/\mathrm{TA_{t-1}}] \quad (1)$$

where $\mathrm{TDA_t}$ = total discretionary accruals; $\mathrm{TA_{t-1}}$ = lagged total assets; $\mathrm{TACC_t}$ = total accruals = reported earnings minus operating cash flows; $\Delta\mathrm{REV_t}$ = the change in revenues; $\Delta\mathrm{AR_t}$ = the change in accounts receivable; $\mathrm{PPE_t}$ = plant, property and equipment; α_1 to α_3 are the OLS model parameters estimated for the sector-year category for the particular observation.

In our sensitivity tests, presented later, we also estimate a variant of $\mathrm{TDA_t}$ in which the term $(\Delta\mathrm{REV_t} - \Delta\mathrm{AR_t})/\mathrm{TA_{t-1}}$ is replaced by $\Delta\mathrm{REV_t}/\mathrm{TA_{t-1}}$. This cross-sectional version of the original Jones (1991) model is also used by DDN.[2]

UK studies by Peasnell *et al.* (2000, 2005) and Al-Attar *et al.* (2008) have employed cross-sectional models that focus on working capital accruals rather than total accruals. The rationale for this is that systematic earnings management via the depreciation accrual is likely to have limited potential. Following these prior UK studies, we estimate working capital discretionary accruals (WCDA) as the residual from a regression of working capital accruals onto a vector of units, and the change in revenues minus the change in accounts receivable, with all variables deflated by lagged total assets:

$$\mathrm{WCDA_t} = \mathrm{WC_{t-1}}/\mathrm{TA_{t-1}} - [\mathrm{X_1} + \mathrm{X_2}(\Delta\mathrm{REV_t} - \Delta\mathrm{AR_t})/\mathrm{TA_{t-1}}] \quad (2)$$

where $\mathrm{WCDA_t}$ = working capital discretionary accruals; $\mathrm{TA_{t-1}}$ = lagged total assets; $\mathrm{WC_t}$ = working capital accruals = the change in non-cash current assets minus the change in current liabilities; $\Delta\mathrm{REV_t}$ = the change in revenues; $\Delta\mathrm{AR_t}$ = the change in accounts receivable; $\chi_1$and χ_2 = the OLS model parameters estimated for the sector-year category for the particular observation.

We use lagged total assets as the deflator for our regressions, consistent with most prior studies on earnings management. Durtschi and Easton (2005) note that the use of price-based deflators is problematic because prices for small-loss firms are usually lower than for small-profit firms. Discretionary accruals are trimmed of their 1st and 99th percentiles for consistency with DDN (p. 6), who use this approach to screen for outliers. This generates a final sample of 3778 firm-year observations. In Table 1 we report the descriptive statistics for our estimates of discretionary accruals.

The trimming of extreme percentiles leads to non-zero means for our discretionary accruals estimates. We also observe that these estimates cannot be accepted as being normally distributed, although it may be noted that mean and median values tend to show the same general patterns within our sample.

Table 1. Analysis of discretionary accruals estimates.

	Total discretionary accruals: Dechow *et al.* (1995)	Total discretionary accruals: Jones (1991)	Working capital discretionary accruals: Peasnell *et al.* (2000)
Mean	−0.01017	−0.01019	−0.00401
Median	0.00003	0.00000	−0.00732
Standard deviation	0.09852	0.09812	0.08739
Minimum	−0.58473	−0.57132	−0.37738
Maximum	0.35997	0.36425	0.42407
Testing null hypothesis of normal distribution:			
Kolmogorov-Smirnov	0.122*	0.124*	0.090**
Shapiro-Wilk	0.889**	0.888**	0.948**

Total discretionary accruals (TDA) are estimated following Dechow *et al.* (1995):

$TDA_t = TACC_t / TA_{t-1} - [\alpha_1.1/TA_{t-1} + \alpha_2.(\Delta REV_t - \Delta AR_t)/TA_{t-1} + \alpha_3.PPE_t/TA_{t-1}]$
where TA_{t-1} = lagged total assets; TACC = total accruals = reported earnings minus operating cash flows; ΔREV = the change in revenues; ΔAR = the change in accounts receivable; PPE = plant, property and equipment; α_1 to α_3 are the OLS model parameters estimated for the sector-year category for the particular observation.

We also examine two alternative estimates: a cross-sectional version of the original Jones (1991) model identical to the above procedure but which excludes the ΔAR_t term, and a model for working capital discretionary accruals (WCDA) used by Peasnell *et al.* (2000):

$WCDA_t = WC_t/TA_{t-1} - [\chi_1 + \chi_2.(\Delta REV_t - \Delta AR_t)/TA_{t-1}]$
where TA_{t-1} = lagged total assets; WC = working capital accruals = the change in non-cash current assets minus the change in current liabilities; ΔREV = the change in revenues; ΔAR = the change in accounts receivable; $\chi_1$and χ_2 = the OLS model parameters estimated for the sector-year category for the particular observation.
*,** indicates rejection of the null hypothesis of normality at the 0.05 and 0.01 probability levels.

Most data items are taken straight from *Datastream* but several of our variables require further explanation. Pre-managed earnings (PME) are defined as reported earnings minus discretionary accruals. Expected dividends (EXPDIV) are proxied by the previous year's dividend payments, following DDN.[3] Related to this variable we introduce a binary indicator for non-paying firms (NONPAYER), which takes a value of unity where the expected dividend is zero (non-payers) and a value of zero elsewhere.

Following DDN, we calculate the deficit in pre-managed earnings relative to the expected dividend:

$$DEFICIT = Max\left[0 \quad , \quad \left\{\underbrace{\text{Expected Dividend}}_{\text{Lagged Dividend}} - \underbrace{\text{Pre} - \text{managed Earnings}}_{\text{Earnings}-\text{Discretionary Accruals}}\right\}\right] \qquad (3)$$

Thus, if pre-managed earnings exceed the expected dividend the deficit is zero, but the deficit will be a positive number if expected dividends exceed pre-managed earnings. DDN suggest that the association between discretionary accruals and DEFICIT may differ significantly between payers and non-payers. This is because the expected dividend is zero for non-payers. A positive DEFICIT for non-payers indicates cases where pre-managed earnings are below zero. Upward earnings management in such cases is indicative of loss avoidance rather than a concern with achieving dividend thresholds.

In their study DDN also employ three measures of managerial incentives: the change in the executives' wealth corresponding to a 1% change in the share price (delta); the change in the

executives' wealth corresponding to a 0.01 change in the annualised standard deviation of share returns (vega); and the executives' salaries including bonuses (cash compensation). None of these data are readily available from *Datastream* and the empirical evidence presented by DDN (Table 3, p. 9) suggests that neither the delta nor the vega metrics are consistently statistically significant. However, the cash compensation metric is significant across all of DDN's models so we use a proxy for this metric. We employ survey evidence collected from *The Guardian* newspaper's website during 2007, to identify the top-35 executive salaries among UK firms at 2004, the end point of our empirical sample.[4] Some of these executives belong to the same company or to financial companies that are excluded from our sample. Thus we can identify 20 firms whose executives are the most highly rewarded within our sample. We use this to create a dummy CASHCOMP, which takes a value of unity for the 20 firms with the highest levels of cash compensation, and zero elsewhere.

An innovation of our paper is the consideration of financial distress as a determinant of discretionary accruals (see Butler *et al.* 2004). Our measure of financial distress is calculated using the one-year-ahead bankruptcy probability model estimated by Charitou *et al.* (2004) for UK non-financial firms. Their three-factor model takes the form:

$$\ln\left(\frac{PB}{1-PB}\right) = 12.38F1 - 20.96F2 - 3.01F3 - 7.17 \tag{4}$$

where PB = probability of bankruptcy one-year-ahead; $F1$ = total liabilities ÷ total assets; $F2$ = earnings before interest and tax ÷ total liabilities; $F3$ = cash flows from operations ÷ total liabilities.

3.2. *Methodology*

Our test methodology begins with a tabular analysis of total discretionary accruals both for dividend payers and non-payers, similar to that employed by DDN. First we examine whether discretionary accruals are higher when there is a positive value for DEFICIT, indicating that pre-managed earnings fall short of the expected dividend. If dividend thresholds are important for UK firms it is expected that this phenomenon will be observed among the sample of dividend-paying firms. For non-paying firms the expected dividend is zero so a positive DEFICIT indicates a shortfall in pre-managed earnings relative to zero. Any upward management of earnings in such cases would reflect loss avoidance. DDN report no significant evidence of such behaviour in their US sample but Gore *et al.* (2007) report that loss avoidance is prevalent among UK firms although they provide no breakdown of results for dividend payers and non-payers.

In addition to the tabular analysis, DDN's study also uses OLS regression models. These allow the association between discretionary accruals and dividend threshold variables to be examined within a multivariate setting. However, none of their tables report any formal tests for the normality of discretionary accruals. We find that for both discretionary accruals and working capital discretionary accruals, the distributions, whilst demonstrating the familiar bell shape, do not approximate closely enough to a normal distribution to pass either the Shapiro-Wilk or Kolmogorov-Smirnov tests for normality. For this reason our main focus will be on binary dependent variables, examining the probability of a firm having positive discretionary accruals (i.e. upward earnings management) using logit regression models.

DDN's models also include seven control variables: retained earnings; three measures of managerial incentives (delta, vega and cash compensation); firm size; leverage and market-to-book value. However, their results show that few of these control variables generate slope estimates

that are consistent with regard to either significance levels or signs across different models (DDN, Table 3, p. 9). This casts some doubt on the wisdom of including these variables. The inclusion of inappropriate or spuriously associated variables within econometric models can induce corrupted results and unjustified conclusions. To guard against this we present our main models both including and excluding the control variables.

Most of our regression tests are conducted around DDN's main model, albeit in logit form, which we refer to as our 'Deficit Model':

Deficit Model:

$$\ln\left(\frac{P}{1-P}\right) = \delta_1 + \delta_2.DEFICIT + \delta_3.(DEFICIT \times NONPAYER) + \delta_4.NONPAYER + \sum_{j=1}^{6} \delta_{5+j}.C_j \quad (5)$$

where P = probability that discretionary accruals > 0; DEFICIT = dummy variable for the deficit in pre-managed earnings relative to the expected dividend and taking a value given by *Max*(0, EXPDIV – PME); NONPAYER = dummy taking a value of unity if dividends were paid in the previous year and zero otherwise; C_j = control variables for leverage, firm size, book-to-market value, management incentives, retained earnings and lagged earnings; δ_1 to δ_{5+j} = logit slope estimates.

A more basic variant of this model is also used by DDN in which the two components of DEFICIT, pre-managed earnings (PME) and the expected dividend (EXPDIV), are included separately. However, this provides a more limited insight into the direct relationship between DEFICIT and earnings management. Within our study this model takes the form below and is referred to as our 'PME Model':

PME Model:

$$\ln\left(\frac{P}{1-P}\right) = \theta_1 + \theta_2.PME + \theta_3.EXPDIV + \theta_4.NONPAYER + \sum_{j=1}^{6} \theta_{4+j}.C_j \quad (6)$$

where PME = pre-managed earnings, i.e. reported earnings minus discretionary accruals; EXPDIV = the expected dividend in the current year proxied by last year's dividend; NONPAYER = dummy taking a value of unity if dividends were paid in the previous year and zero otherwise; θ_1 to θ_{4+j} = logit slope estimates.

The next section presents our main results. It begins with a tabular analysis of total discretionary accruals across our sample of UK firms and then moves on to a multivariate analysis of the probability of upward earnings management using logit regressions.

4. Results

4.1. *Tabular analysis of discretionary accruals and DEFICIT*

In their study of US firms, DDN (Table 2, p. 8) report that among dividend paying firms with no deficit (DEFICIT = 0) more than half (58%) report total discretionary accruals that are negative. However, for those firms with a deficit (DEFICIT > 0) the vast majority (81%) report discretionary accruals that are positive. Our equivalent proportions are presented in Table 2.

The pattern of discretionary accruals for UK dividend-paying firms follows very closely that reported by DDN for US firms. We find that among UK dividend-paying firms with

Table 2. Are dividend payers with deficits more likely to manage earnings upwards?

	Total discretionary accruals < 0	Total discretionary accruals > 0	Total
Firm-years with DEFICIT $= 0$	64.5%	35.5%	100%
	1406	774	2180
Firm-years with DEFICIT > 0	20.5%	79.5%	100%
	246	951	1197
Total	48.9%	51.1%	100%
	1652	1725	3377

Discretionary accruals are estimated following Dechow *et al.* (1995).
DEFICIT = *Max*[0, expected dividend – pre-managed earnings], where expected dividend = previous year's dividend, and pre-managed earnings = reported earnings – discretionary accruals estimate.

DEFICIT $= 0$, more than half (64.5%) report negative discretionary accruals, but that where DEFICIT > 0 the vast majority (79.5%) report positive discretionary accruals.

DDN (Table 2, p. 8) also identify that for dividend-payers the average level of discretionary accruals increases with the size of the deficit. A similar pattern is observed for our UK data, reported in Table 3.

Table 3 shows that for UK dividend-paying firms where DEFICIT $= 0$, discretionary accruals average -3.33% of total assets. For the lowest quintile of firms for which DEFICIT > 0 discretionary accruals average 1.86% of total assets. This rises steadily across the DEFICIT quintiles and the upper quintile shows discretionary accruals averaging 6.06% of total assets. These results provide some initial support for the hypothesis that dividend-paying firms are prepared to manage earnings upwards in cases where their pre-managed earnings are in deficit relative to the expected dividend.

One related issue not examined in DDN's tabular analysis is how discretionary accruals vary across DEFICIT quintiles for non-payers. Since expected dividends are proxied by the previous year's dividend, the expected dividend for non-payers is always zero. This means that DEFICIT for non-payers shows the shortfall in pre-managed earnings relative to zero. Earnings management in such cases is likely to reflect loss avoidance.

For UK non-paying firms where DEFICIT $= 0$, discretionary accruals average -5.05% of total assets. This confirms the evidence from dividend-payers that in the absence of any deficit in

Table 3. Do firms with deficits have higher total discretionary accruals?

DEFICIT	*Payers* $N = 3377$ Mean total discretionary accruals	*Non-payers* $N = 401$ Mean total discretionary accruals
DEFICIT > 0		
Quintile 1 (lowest)	0.0186	−0.0019
Quintile 2	0.0268	−0.0301
Quintile 3	0.0416	0.0091
Quintile 4	0.0462	−0.0348
Quintile 5 (highest)	0.0606	0.0165
DEFICIT $= 0$	−0.0333	−0.0505

Firms are classed as *Payers* for the current year if they paid a dividend in the previous year, consistent with DDN (2008). Total discretionary accruals estimated following Dechow *et al.* (1995).
DEFICIT = *Max*[0, expected dividend – pre-managed earnings], where expected dividend = previous year's dividend, and pre-managed earnings = reported earnings – discretionary accruals estimate. For non-payers this represents the shortfall of pre-managed earnings relative to the break-even point (i.e. zero) and so can be linked to loss-avoidance.

pre-managed earnings relative to the target (in this case loss avoidance rather than dividend thresholds), there is no incentive for firms to upwardly manage earnings. However, across the quintiles for DEFICIT > 0 there is no longer the strong discernable trend in discretionary accruals that is seen for dividend-payers. It is true that the largest average value for discretionary accruals is found for the upper quintile for DEFICIT, representing 1.65% of total assets, but this is much smaller than the equivalent value for the upper quintile of DEFICIT for dividend-payers. It can also be seen that the trend in average discretionary accruals across all quintile groups is very uneven.

4.2. *Logit analysis of discretionary accruals and DEFICIT*

Table 4 presents descriptive statistics for the main logit regression variables. The first group of variables in Table 4 are the binary dependent variables for the logit regressions, indicators of the upward management of reported earnings. These show roughly an equal proportion of positive and negative discretionary accruals.

The second group of variables consists of our main explanatory variables, relating to earnings management, dividends and deficits, which have already been explained. The variable BANKRUPTCY is a dummy variable indicating cases where firms have a greater than 0.5 probability of bankruptcy within the next 12 months. The mean for NONPAYER shows that fewer than

Table 4. Descriptive statistics for logit regression variables.

	N	Mean	Median	Std. Deviation
Binary dependent variables for logit:				
TDA (Dechow *et al.* 1995) > 0	3881	0.5032	1	0.50005
TDA (Jones 1991) > 0	3881	0.5030	1	0.50006
WCDA (Peasnell *et al.* 2000) > 0	3881	0.4478	0	0.49733
Main test variables:				
EXPDIV	3780	0.0314	0.0275	0.03589
NONPAYER	3793	0.1057	0	0.30752
PME (Dechow *et al.* 1995)	3881	0.0551	0.0536	0.22956
PME (Jones 1991)	3881	0.0551	0.0531	0.22947
PME (Peasnell *et al.* 2000)	3881	0.0489	0.0621	0.24214
DEFICIT (Dechow *et al.* 1995)	3778	0.0392	0	0.27684
DEFICIT (Jones 1991)	3778	0.0392	0	0.27679
DEFICIT (Peasnell *et al.* 2000)	3778	0.0508	0	0.28464
BANKRUPTCY	3869	0.2135	0	0.40982
Control variables:				
$SIZE_{t-1}$	3811	12.5483	12.3637	1.64159
BMV_{t-1}	3842	0.4061	0.3367	0.78037
$GEARING_{t-1}$	3880	0.2872	0.1829	3.05025
CASHCOMP	3881	0.0245	0	0.15455
$RETEARN_{t-1}$	3819	0.0380	0.0351	1.5178
$EARN_{t-1}$	3863	0.0645	0.0606	1.13796

TDA = total discretionary accruals estimated using both Dechow *et al.* (1995) and (Jones 1991) models; WCDA = working capital discretionary accruals estimated using Peasnell *et al.* (2000) model; EXPDIV = expected dividend (previous year's dividend); NONPAYER = dummy for firms that did not pay a dividend in the previous year; PME = pre-managed earnings = reported earnings – discretionary accruals estimate; DEFICIT = *Max*[0, expected dividend – pre-managed earnings], where expected dividend = previous year's dividend, and pre-managed earnings = reported earnings – discretionary accruals; BANKRUPTCY = dummy variable indicating firms with a greater than 0.50 probability of one-year-ahead bankruptcy; $SIZE_{t-1}$ = ln(market value of equity, lagged); BMV_{t-1} = lagged book-to-market value ratio; $GEARING_{t-1}$ = lagged debt to total assets ratio; CASHCOMP = a dummy for the top-20 UK firms in relation to cash compensation (salary) paid to their executives at the end-point of our study (2004); $RETEARN_{t-1}$ = amount of last year's earnings that was retained; $EARN_{t-1}$ = lagged reported earnings.
TDA, WCDA, PME, EXPDIV, DEFICIT, RETEARN and EARN are deflated by lagged total assets.

one in nine observations within our sample relate to cases where firms did not pay a dividend in the previous year. This supports the prior evidence on the widespread use of dividend payments by UK firms but probably overstates the proportion of dividend-paying firms since this figure relates to firm-year observations rather than firms *per se*. New firms are more likely to be non-payers but less likely to have a full set of yearly observations across 1994–2004 and will therefore have fewer firm-years. The mean value for DEFICIT is positive, of course, since this variable is calculated with a lower bound of zero.

The final group of variables in Table 4 lists the control variables, which are based on those employed by DDN. These include firm size, book-to-market value, gearing, a dummy for the highest levels of executive cash compensation, the level of last year's earnings and the amount of last year's earnings that is retained. Comparing these last two data items shows that across our sample around half of annual earnings are retained by UK firms.

On the basis of the analysis in Table 3, earnings management would appear to be more strongly associated with achieving dividend thresholds than with concerns regarding loss avoidance. This tentative conclusion is reaffirmed by the results of our Deficit Model and PME Model (equations 5 and 6, respectively). Both models are estimated with and without the control variables, although results are materially similar in either case.[5] These results are reported in Table 5.

Table 5. Logit analysis of the probability of upward earnings management by UK firms.

	Logit regressions			
	Binary dependent variable = 1 if total discretionary accruals (TDA) > 0 and zero otherwise.			
	PME model (no controls)	PME model (with controls)	Deficit model (no controls)	Deficit model (with controls)
PME	−9.826**	−9.447**		
EXPDIV	11.578**	14.839**		
NONPAYER	−0.886**	−0.817**	−0.147	−0.175
DEFICIT			4.137**	3.436**
DEFICIT × NONPAYER			−3.813**	−3.129**
Control variables:				
$SIZE_{t-1}$		0.043		0.020
BMV_{t-1}		0.104**		0.123**
$GEARING_{t-1}$		−0.044**		−0.015
CASHCOMP		−0.090		−0.232
$RETEARN_{t-1}$		0.041		0.005
$EARN_{t-1}$		−0.001		−0.037
Constant	0.301**	−0.686*	−0.039	−0.861**
N	3778	3778	3778	3778
Prediction rate	74.8%	73.2%	65.7%	60.2%

Total discretionary accruals (TDA) are estimated following Dechow *et al.* (1995) as explained in the notes to Table 1. PME = pre-managed earnings = reported earnings – discretionary accruals estimate; EXPDIV = expected dividend (previous year's dividend); NONPAYER = dummy for firms that did not pay a dividend in the previous year; DEFICIT = *Max*[0, expected dividend – pre-managed earnings], where expected dividend = previous year's dividend, and pre-managed earnings = reported earnings – discretionary accruals; $SIZE_{t-1}$ = ln(market value of equity, lagged); BMV_{t-1} = lagged book-to-market value ratio; $GEARING_{t-1}$ = lagged debt to total assets ratio; CASHCOMP = a dummy for the top-20 UK firms in relation to cash compensation (salary) paid to their executives at the end-point of our study (2004); $RETEARN_{t-1}$ = amount of last year's earnings that was retained; $EARN_{t-1}$ = lagged reported earnings. TDA, PME, EXPDIV, DEFICIT, RETEARN and EARN are deflated by lagged total assets.
*,** indicates rejection of the null hypothesis of slope = 0 at the 0.05 and 0.01 probability levels.

We begin with our PME Model in which a dummy variable for positive total discretionary accruals is regressed onto a dummy variable for non-payers (NONPAYER) and the two components of DEFICIT, namely, pre-managed earnings (PME) and the expected dividend (EXPDIV). Our results show that the probability of a firm reporting positive discretionary accruals is significantly increased by the level of the expected dividend, and significantly decreased by both the level of pre-managed earnings and being a non-payer. The first two results are what would be expected if the upward management of earnings were positively associated with the level of DEFICIT and show the positive impact of expected dividends on the likelihood of upward earnings management. The negative slope for NONPAYER appears to confirm our analysis of discretionary accruals in Table 3, suggesting that loss avoidance for non-paying firms is a less frequent cause for upward earnings management than is the need of dividend-payers to achieve dividend thresholds.

We next investigate our Deficit Model in which a dummy variable for positive discretionary accruals is regressed onto a dummy variable for non-payers (NONPAYER), the deficit (DEFICIT) and the interactive variable DEFICIT $\times$ NONPAYER. The inclusion of the interactive variable allows us to examine whether the magnitude of DEFICIT is associated with increased discretionary accruals in a similar manner for both payers and non-payers. The results of the logit regressions in Table 5 demonstrate that the probability that a firm will have positive discretionary accruals is significantly positively associated with DEFICIT. However, for non-payers this association is greatly reduced.[6] To this point our UK results are similar to those reported by DDN for US firms. However, one dimension not controlled within DDN's study is bankruptcy risk.

Prior research indicates that bankruptcy risk can influence the information content of accruals data for UK firms (Al-Attar *et al.* 2008) and that it is related to the magnitude and sign of discretionary accruals. Direct evidence for this latter point comes from Butler *et al.* (2004) who find that discretionary accruals are very large for US firms facing financial distress, and negative in sign:

> 'The evidence is consistent with the view that firms in severe financial distress ... engage in liquidity enhancing transactions (e.g. delaying payables or factoring receivables) that result in large negative accruals.' (Butler *et al.* 2004, p. 141)

> '[F]inancially distressed firms often face liquidity constraints that force them to reduce non-cash net working capital to survive. It is also likely that these firms have non-performing assets that they are required to write off under GAAP.' (Butler *et al.* 2004, p. 156)

UK evidence also points to firms in financial distress exhibiting large, negative discretionary accruals (Zuo and Hussain 2008).

To assess this potentially important dimension to our study we employ the one-year-ahead bankruptcy probability model developed by Charitou *et al.* (2004). We can report that for our sample of UK firms the average bankruptcy probability for dividend-paying firms is only 0.19 but for non-payers it is 0.55.[7] The greater prevalence of financial distress among non-payers could explain both the US results of DDN and the UK results in our paper. Both sets of results suggest that positive discretionary accruals are more strongly associated with DEFICIT for dividend-payers than for non-payers. However, this finding could be due to a sub-sample of non-payers with very large negative discretionary accruals skewing the results. DDN do not test this hypothesis.

To re-examine our regression results we re-run our original Deficit Model regression adding the dummy variable BANKRUPTCY, which takes a value of unity for firms estimated to have a greater than 0.5 probability of going bankrupt within one year, and zero otherwise. If firms with high levels of financial distress often exhibit unusually large, negative accruals then by controlling for this factor we can reassess the relationship between discretionary accruals and DEFICIT. To

Table 6. Extending the analysis to include bankruptcy risk and different estimates of discretionary accruals.

	Logit regressions		
	Binary dependent variable = 1 if discretionary accruals > 0 and zero otherwise.		
	Total discretionary accruals: Dechow *et al.* (1995)	Total discretionary accruals: Jones (1991)	Working capital discretionary accruals: Peasnell *et al.* (2000)
BANKRUPTCY	−0.976**	−0.956**	−0.615**
NONPAYER	−0.106	−0.123	0.069
DEFICIT	5.356**	5.326**	6.703**
DEFICIT × NONPAYER	−1.328	−1.153	−4.441**
Control variables:			
$SIZE_{t-1}$	0.006	0.008	−0.019
BMV_{t-1}	0.103**	0.110**	−0.053**
$GEARING_{t-1}$	0.020	0.016	0.006
CASHCOMP	−0.344	−0.204	−0.206
$RETEARN_{t-1}$	0.000	0.000	−0.004
$EARN_{t-1}$	−0.021	−0.021	−0.020
Constant	−0.649*	−0.701*	0.195
N	3778	3778	3778
Prediction rate	63.8%	63.9%	66.1%

Total discretionary accruals (TDA) are estimated following Dechow *et al.* (1995) and Jones (1991), and working capital discretionary accruals (WCDA) are estimated following Peasnell *et al.* (2000) as explained in the notes to Table 1.

BANKRUPTCY = dummy variable indicating firms with a greater than 0.50 probability of one-year-ahead bankruptcy; NONPAYER = dummy for firms that did not pay a dividend in the previous year; DEFICIT = *Max*[0, expected dividend – pre-managed earnings], where expected dividend = previous year's dividend, and pre-managed earnings = reported earnings – discretionary accruals estimate; $SIZE_{t-1}$ = ln(market value of equity, lagged); BMV_{t-1} = lagged book-to-market value ratio; $GEARING_{t-1}$ = lagged debt to total assets ratio; CASHCOMP = a dummy for the top-20 UK firms in relation to cash compensation (salary) paid to their executives at the end-point of our study (2004); $RETEARN_{t-1}$ = amount of last year's earnings that are retained; $EARN_{t-1}$ = lagged reported earnings.

TDA, WCDA, PME, EXPDIV, DEFICIT, RETEARN and EARN are deflated by lagged total assets.

*,** indicates rejection of the null hypothesis of slope = 0 at the 0.05 and 0.01 probability levels.

further assess the robustness of our results, this re-estimation is presented in Table 6 for three different estimates of discretionary accruals.

We begin with the first column of estimates in Table 6, which relates to total discretionary accruals calculated following Dechow *et al.* (1995). Our original logit regression (Table 5) contains no control for high bankruptcy risk firms and indicates that the probability of positive discretionary accruals is more strongly related to DEFICIT in the case of dividend-paying firms than for non-payers. Table 6 shows that once we control for bankruptcy risk the difference in the slope for DEFICIT between payers and non-payers becomes statistically insignificant – the slope for the interactive variable DEFICIT × NONPAYER is not significant even at the 0.10 level. The same result also occurs when total discretionary accruals are estimated using a cross-sectional version of the Jones (1991) model. These results would appear to suggest that once the impact of financially distressed firms is controlled there is little difference in how dividend-payers and non-payers manage earnings in response to deficits. However, the final column of Table 6 presents slope estimates based on working capital discretionary accruals (Peasnell *et al.* 2000) and these show that even when the dummy BANKRUPTCY is included in the model the original patterns reported in Table 5 remain. The probability of positive working capital accruals is positively

associated with DEFICIT for dividend-payers and non-payers, but to a much greater degree in the case of the dividend-payers.

Earnings management is more likely to be reflected in working capital discretionary accruals than total discretionary accruals (Peasnell *et al.* 2000, 2005). The former are more heavily reliant on managers' short-term forecasts and judgements than are long-term accruals (see Richardson *et al.* 2005) and so are the more obvious items with which to 'manage' earnings on a year-by-year basis. This will be discussed further in section 5. The next section includes a number of additional tests of working capital discretionary accruals.

4.3. *Additional tests*

Studies by Citron (1992), Day and Taylor (1998) and Moir and Sudarsanam (2007) present evidence that, within the UK market, debt covenants are less likely to apply to debt contracts for the largest firms. If large firms are relatively less restricted by financial covenants, then they may be under less pressure to manage earnings upwards when facing deficits. To assess this point empirically we replicate our Deficit Model regression with the inclusion of a new interactive variable, DEFICIT × LARGE, where LARGE is a dummy variable taking a value of unity for members of the FTSE-100 index, and zero elsewhere.

With regard to taxes, one of the major changes within the UK context was the Finance Act 1997. By making dividends relatively less attractive to pension funds than they had previously been, it has been argued that the value of dividends to institutional investors may have been adversely affected (Bell and Jenkinson 2002). If this is true, then firms that previously felt pressured to maintain last year's dividend, and thus manage reported earnings levels, will no longer feel under the same pressure and so may resist the temptation to manage earnings upwards after 1997. To assess the impact of the Finance Act 1997 we introduce a dummy variable that takes a value of unity for post-1997 observations, and zero otherwise (POST97). To assess possible changes in how firms respond to deficits pre-1997 and post-1997 we also create an interactive variable DEFICIT × POST97.

Finally, one factor that may additionally influence earnings management is the level of firm leverage or gearing. Our main set of control variables already includes the debt-to-assets ratio GEARING but we also introduce a dummy variable LOWGEAR for firms with below-median gearing (debt-to-total assets < 0.1829) to assess the impact of low gearing on the slope coefficient for DEFICIT via an interactive variable, DEFICIT × LOWGEAR.

These new dummy and interactive variables are used to augment our original Deficit Model (Equation 5).[8] This augmented version of our original Deficit Model we refer to as Deficit Model II and the estimation results are reported in Table 7. An alternative specification of this model, denoted Deficit Model III, is also reported in Table 7. Here we replace the variable DEFICIT with the interactive variable DEFICIT × PAYER.[9] This produces an identical regression model to Deficit Model II but we can now test whether the slope for the variable DEFICIT for non-payers is significantly different from zero (rather than being different to the slope for payers).

The results in Table 7 reiterate our findings in Table 6. However, the new interactive variable DEFICIT × LARGE generates a significant negative slope, which indicates that the largest UK firms are less likely to manage earnings upwards to meet dividend thresholds than smaller firms. This finding is consistent with prior UK evidence suggesting that large firms have a greater chance of obtaining debt contracts that are free of restrictive debt covenants. There is no evidence that either the Finance Act 1997 (POST97) or gearing influence the regression results. With regard to the latter finding, it may be noted here that Moir and Sudarsanam

Table 7. Firm-year characteristics and the likelihood of upward earnings management via working capital accruals.

	Logit regressions	
	Binary dependent variable = 1 if working capital discretionary accruals > 0 and zero otherwise.	
	Deficit Model II	Deficit Model III
BANKRUPTCY	−0.937**	−0.937**
DEFICIT	15.025**	
NONPAYER	0.275	0.275
DEFICIT × NONPAYER	−12.168**	2.857*
DEFICIT × LARGE	−15.488**	−15.488**
POST97	0.044	0.044
DEFICIT × POST97	−0.665	−0.665
DEFICIT × LOWGEAR	0.519	0.519
DEFICIT × PAYER		15.025***
Control variables:		
$SIZE_{t-1}$	−0.011	−0.011
BMV_{t-1}	−0.062**	−0.062**
$GEARING_{t-1}$	0.011	0.011
CASHCOMP	0.037	0.037
$RETEARN_{t-1}$	−0.004	−0.004
$EARN_{t-1}$	−0.013	−0.013
Constant	0.009**	0.009**
N	3778	3778
Prediction rate	67.90%	67.90%

Working capital discretionary accruals (WCDA) are estimated following Peasnell *et al.* (2000).
BANKRUPTCY = dummy variable indicating firms with a greater than 0.50 probability of one-year-ahead bankruptcy; DEFICIT = *Max*[0, expected dividend – pre-managed earnings], where expected dividend = previous year's dividend, and pre-managed earnings = reported earnings – discretionary accruals estimate; NONPAYER = dummy for firms that did not pay a dividend in the previous year; PAYER = (1 – NONPAYER); LARGE = dummy variable indicating membership of the FTSE-100 index; POST97 = dummy variable indicating those firm-years occurring post Finance Act 1997; LOWGEAR = dummy variable for firms with below-median debt-to-total assets; $SIZE_{t-1}$ = ln(market value of equity, lagged); BMV_{t-1} = lagged book-to-market value ratio; $GEARING_{t-1}$ = lagged debt to total assets ratio; CASHCOMP = a dummy for the top-20 UK firms in relation to cash compensation (salary) paid to their executives at the end-point of our study (2004); $RETEARN_{t-1}$ = amount of last year's earnings that are retained; $EARN_{t-1}$ = lagged reported earnings.
WCDA, DEFICIT, RETEARN and EARN are deflated by lagged total assets.
*,** indicates rejection of the null hypothesis of slope = 0 at the 0.05 and 0.01 probability levels.

(2007) report that gearing ratios are not significantly different between covenanter and non-covenanter UK firms.

We end this section with a note on loss avoidance by non-paying firms. In our main results, presented in Tables 5 and 6, we find that a one-unit change in DEFICIT for dividend-payers is associated with a significantly higher probability of upward earnings management than for non-payers. DDN report that the DEFICIT slope for non-payers is insignificantly different from zero. By including the interactive term DEFICIT x NONPAYER in Deficit Model III we can test whether the slope for DEFICIT is different from zero for UK non-payers. Although the slope for this interactive term is small, it is positive and statistically significant. This demonstrates that loss avoidance is important for non-paying firms in the UK. While this result differs from DDN's result for US firms, it is consistent with prior UK evidence from Gore *et al.* (2007) on the prevalence of earnings management among UK firms for the purpose of loss avoidance.

5. Discussion

5.1. *Total versus working capital discretionary accruals*

The results presented above indicate that UK dividend-paying firms tend to manage earnings upwards in cases where pre-managed earnings fall short of the expected dividend. For non-paying firms, the management of earnings to avoid losses is on a smaller scale, though still significantly greater than zero. Once we control for bankruptcy risk, an examination of total discretionary accruals suggests there is now no significant difference between how payers respond to a deficit in pre-managed earnings relative to the dividend threshold, and how non-payers respond to a deficit in pre-managed earnings relative to the break-even point (i.e. loss avoidance). Only when we focus on working capital discretionary accruals do our original results hold.

A major rationale for the focus on working capital discretionary accruals in UK papers such as Peasnell *et al.* (2000, 2005) and Al-Attar *et al.* (2008) is the suggestion that short-term accruals are more likely to reflect discretionary behaviour by managers than long-term accruals because they rely on yearly estimates that can more easily be altered to attain yearly earnings targets. The greater potential for short-term accruals to reflect earnings management is noted by Beneish (1998) and reiterated by Gore *et al.* (2007, p. 128). In addition, Richardson *et al.* (2005, pp. 448–449) identify that short-term accrual items like changes in inventory and accounts receivable are among the most likely accounting items to be employed in the management of reported earnings numbers.

The major long-term accrual item, depreciation, is often large in magnitude relative to individual short-term accruals (Al-Attar and Hussain 2004, Al-Attar *et al.* 2008). It is therefore possible that cross-sectional variations in the level of depreciation may mask small variations in short-term accruals when examining total discretionary accruals. In cases of extreme financial distress the negative short-term accruals are sufficiently large to outweigh the masking effect of depreciation, which helps explain our results in Table 5. However, once these extreme cases (BANKRUPTCY = 1) are controlled, then earnings management via short-term accruals for healthy firms (BANKRUPTCY = 0) is much more difficult to identify. Differences in how payers and non-payers manage earnings in response to deficits become more difficult to observe, hence the insignificant slope for the interactive variable DEFICIT x NONPAYER in Table 6. Only when we focus solely on working capital discretionary accruals, which exclude the impact of depreciation, can we still identify the differential responses of payers and non-payers to DEFICIT.

5.2. *Limitations and future research*

At present there is no universally accepted methodology for the estimation of discretionary accruals. As a result the literature throws up a vast array of suggested models in addition to those used here. The inclusion of all these would lead to an unwieldy research paper so we have focused on the two most popular models for discretionary accruals, a cross-sectional version of the Jones (1991) model and the Dechow *et al.* (1995) model, both of which are also used by DDN. However, we also choose to employ the Peasnell *et al.* (2000) model because it focuses solely on working capital accruals and so is conceptually different to models for total discretionary accruals.

Regarding control variables for discretionary accruals, here too there is a vast array of suggestions from prior research covering various metrics for corporate governance, firm performance, relative performance, market expectations and ownership structure. We are therefore forced to take a somewhat parsimonious approach to variable selection and focus primarily on those variables that appear in DDN's study. We acknowledge that our metric CASHCOMP is a relatively

crude indicator for executive compensation, which could explain the variable's weak explanatory power in our study. However, it should be noted that our study deflates discretionary accruals by lagged total assets, as do most prior studies of earnings management, but DDN's study focuses on un-scaled, dollar discretionary accruals and this could have resulted in some variations with regard to the estimated slopes for some control variables. Future research may wish to re-examine our findings with different estimates for discretionary accruals and control variables.

With regard to future research, there is a clear need for more information on the nature of debt covenants for UK firms, and how the nature of these covenants varies with firm characteristics. Although our study suggests that firm size influences the degree to which firms manage earnings and links this to the less restrictive nature of covenants for large UK firms, it must be acknowledged that our results are indicative but not conclusive. Interviews and surveys of lending bankers could shed more light on this issue. It would also be interesting to investigate whether UK firms have an unwritten understanding with lending institutions that dividends will be held within certain limits. This would be consistent with our findings but more research is needed on this point.

In addition to debt covenants, another factor that may cause UK firms to manage their earnings numbers in relation to the level of their dividend payments is a concern for coverage ratios (Barker 1999, p. 212). It is possible that this focus on dividend coverage ratios within the UK business community could lead to dividend thresholds within the UK market even for those firms that face no debt covenant restrictions. The degree to which this contributes to observations of earnings management within the UK market is worthy of further investigation.

6. Conclusion

Our study examines earnings management and dividend payments for a large sample of UK firms during the period 1994–2004. We find that UK dividend-paying firms are more likely to manage earnings upwards than non-payers. This phenomenon is driven by cases where dividend-paying firms experience a shortfall (deficit) in their pre-managed earnings relative to the level of the expected dividend (last year's dividend). Upward management of earnings is also found for non-dividend paying firms (non-payers) aiming to avoid reporting losses, but this is on a smaller scale. Interestingly, the pressure to upwardly manage earnings appears to be significantly lower for the largest UK firms, which is consistent with prior UK evidence on the reduced usage of restrictive debt covenants by lenders when lending to such firms.

Among our sample of non-paying UK firms are some firms with very high levels of bankruptcy risk. Such firms often generate large negative discretionary accruals. Once these are controlled, the difference in earnings management between payers and non-payers is no longer observable when using total discretionary accruals, but is still observed when using working capital discretionary accruals. Thus, we believe that working capital discretionary accruals are a superior indicator of earnings management than more commonly used measures of total discretionary accruals.

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Notes

1. See Oswald and Young (2004) for a critique of the dataset used by Rau and Vermaelen (2002).

2. DDN use both models within their study but present most of their results for the cross-sectional Jones model. We prefer to focus on Dechow *et al.* (1995) because it takes account of changes in receivables, which are ignored in the original specification of the Jones model. However, results are virtually identical as indicated by our sensitivity testing (see Table 6).
3. DDN investigate a number of alternative proxies for expected dividend but report (p. 15) that their results are materially unchanged.
4. These data are presently no longer available on *The Guardian's* website but can be obtained from the authors on application.
5. Coefficients for our control variables are often insignificant or inconsistent with regard to signs across different models. This mirrors the results reported in DDN's Tables 3 and 4.
6. In section 4.3 we show that although the slope of DEFICIT is much smaller for non-payers, it is positive and statistically different from zero at the 0.05 probability level.
7. This finding is not surprising since Benito and Young (2001, p. 21) note that non-paying UK firms tend to be smaller and are more likely to exhibit poor current earnings numbers.
8. The dummy variables LARGE and LOWGEAR are used on the slopes of the DEFICIT variable to examine whether being a large firm or a low-geared firm influence the relationship between earnings management and deficits. However, these dummies are not included as intercept dummies since our set of control variables already contains measures for firm size (SIZE) and gearing (GEARING).
9. The dummy variable PAYER equals (1 – NONPAYER).

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