

Hard Times or Great Expectations?: Dividend omissions and dividend cuts by UK firms

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Abstract:

This paper uncovers an increasing proportion of quoted UK companies omitting cash dividends. Using a large panel of quoted UK companies, we estimate models for the incidence of dividend omissions and cuts as functions of financial characteristics including cash flow, leverage, investment opportunities, investment and company size. These variables account for most of the increase in omission since 1995. There is relatively little evidence to link this to the major tax reform of 1997 that abolished tax refunds on dividend income payable to tax exempt institutions. Significant persistence effects indicate companies are slow to adjust their balance sheets through dividends.

Key words: Dividends; financial pressure; discrete panel data.

JEL Classification: G35, C23, E52

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1 Introduction

The payment of dividends is one of the key unresolved puzzles of company financial behaviour. Whereas companies would be indifferent to paying dividends under the conditions of Miller and Modigliani (1961), tax considerations can tilt the case towards retaining rather than distributing profits. The puzzle arises when companies pay dividends when tax considerations suggest that their shareholders would be better off if they did not. This has been the case historically in the US. Arguably, transactions costs (for trading equity), agency problems and signalling models provide a case for the payment of dividends but, as Easterbrook (1984, p. 650) noted, ‘businesses find dividends obvious’, whereas ‘economists find dividends mysterious’.

Recent evidence suggests that companies are now beginning to behave, in respect to their dividend payments, in a way which economists might find less mysterious. For example, the proportion of UK quoted companies omitting cash dividends increased to 25.2 per cent in 1999, significantly higher than earlier high-points of dividend omission of 16.1 per cent and 17.9 per cent, in the recessionary years of 1982 and 1992 respectively.⁽¹⁾ But far from resolving the dividend puzzle, this raises the further question of what has changed, if anything, to make businesses behave in this way now. Indeed, has there been a change in the behaviour of individual businesses or have the financial characteristics of the business population changed so as to make dividend payments less likely?

To understand this change, we model the probability that a company omits or cuts its dividend and then consider the extent to which changing characteristics of firms account for this pattern of

⁽¹⁾ In the US, the proportion of publicly traded firms omitting cash dividends increased from 33.5 per cent in 1978 to 79.2 per cent in 1999 (Fama and French, 2001).

increasing omission, as opposed to changing dividend policies *per se*.⁽²⁾ A potentially important factor in the UK is the substantial change to the taxation of corporate source income, with tax credits on dividend payments to pension funds being abolished in July 1997 and Advance Corporation Tax (ACT) ending in April 1999.

Our analysis can be interpreted as examining how firms respond to financial pressure. This is important not least because it sheds light on the transmission mechanism of monetary policy through the corporate sector discussed by Nickell and Nicolitsas (1999). If shocks to corporate cash flows affect the real economy through levels of investment (eg. Bernanke *et al*, 1996, Fazzari *et al*, 1988) then a dividend omission (or cut) may help protect investment plans and thereby attenuate any real effects on investment. Indeed, one view of dividend policies is that they are the central means through which companies attempt to maintain independence of financial and real decisions, adjusting payouts (albeit in a sticky manner) in order to preserve investment plans in the face of shocks to the balance sheet.

The remainder of the paper is organised as follows. Section 2 sketches the theoretical background to the study of dividends, focusing on the ‘dividend puzzle’, and the financial characteristics expected to be related to the propensity to pay a dividend. Section 3 contains data description of some trends in dividend policies and presents estimation results for panel data probit models of dividend omission and dividend cuts. Section 4 concludes.

⁽²⁾ This observation and our subsequent analysis are related to the recent evidence of Fama and French (2001) for US companies. They note that the percentage of publicly traded firms in the US omitting cash dividends has increased from 33.5 per cent in 1978 to 79.2 per cent in 1999. Our econometric methods and the set of issues we address are more general than those of Fama and French (2001).

2 Economic background

According to Fama and French (2001), ‘dividends have long been an enigma’, largely because companies in the US have traditionally paid cash dividends despite a clear tax disadvantage. Various approaches, summarised in Allen and Michaely (1995), have been suggested to reconcile observed practice with simple economic reasoning. These include signalling and the role dividends may play in disciplining companies when there is asymmetric information between managers and outside investors (eg. Miller and Rock, 1985; Easterbrook, 1984).

In this section we ignore any possible informational advantage to dividend payments and instead attempt to clarify the possible institutional reasons why companies might pay dividends even when this is subject to a tax disadvantage. This is particularly important in the UK context where recent tax reform has made dividends much less attractive for the tax-exempt institutions who are the most important single class of equity holders.⁽³⁾ The model we use embodies the so-called ‘new view’ of corporate taxation originating from the work of King (1977) and further developed by Auerbach (1979), Bradford (1981) and others. A recent statement of the model is Auerbach (2001). According to the new view, the optimum level of dividends is chosen jointly with fixed investment and its financing to maximise the value of corporate equity. In the absence of taxes, the model would be consistent with the Modigliani-Miller propositions about the irrelevance of debt and dividend policy to firm values.⁽⁴⁾

A key prediction of the new view is that mature companies obtain equity funds for investment through the retention of earnings and distribute residual funds as dividends, even when the tax system discriminates against dividends (Auerbach and Hassett, 2000). This largely arises from

⁽³⁾ Bell and Jenkinson (2001) examine the recent tax reform to show that the tax exempt funds act as the ‘marginal investor’ in the UK market.

the lack of other feasible tax-efficient ways of distributing funds to shareholders. Dividends cannot be negative as shareholders cannot be forced to commit extra funds to the firm. (There are also upper limits on the size of dividend payments to prevent companies weakening their capital base unduly, although these are not considered in this paper.) It used to be the case in the UK (discussed in King, 1977) that public companies were prevented by law from repurchasing their shares although the rules were changed in the 1981 Companies Act and companies are now allowed to repurchase their shares, although many limitations remain. These exist mainly to prevent firms avoiding tax. In particular, for tax purposes a component of any share buy-back is treated in exactly the same way as a dividend distribution while the size of the capital element is negotiable with the Inland Revenue. This can have advantages for companies wishing to ‘stream’ distributions according to the tax preferences of their different shareholders. The effect from a tax perspective is that share buy-backs can be considered equivalent to dividends rather than a negative new issue of equity. Similar considerations apply in the US.

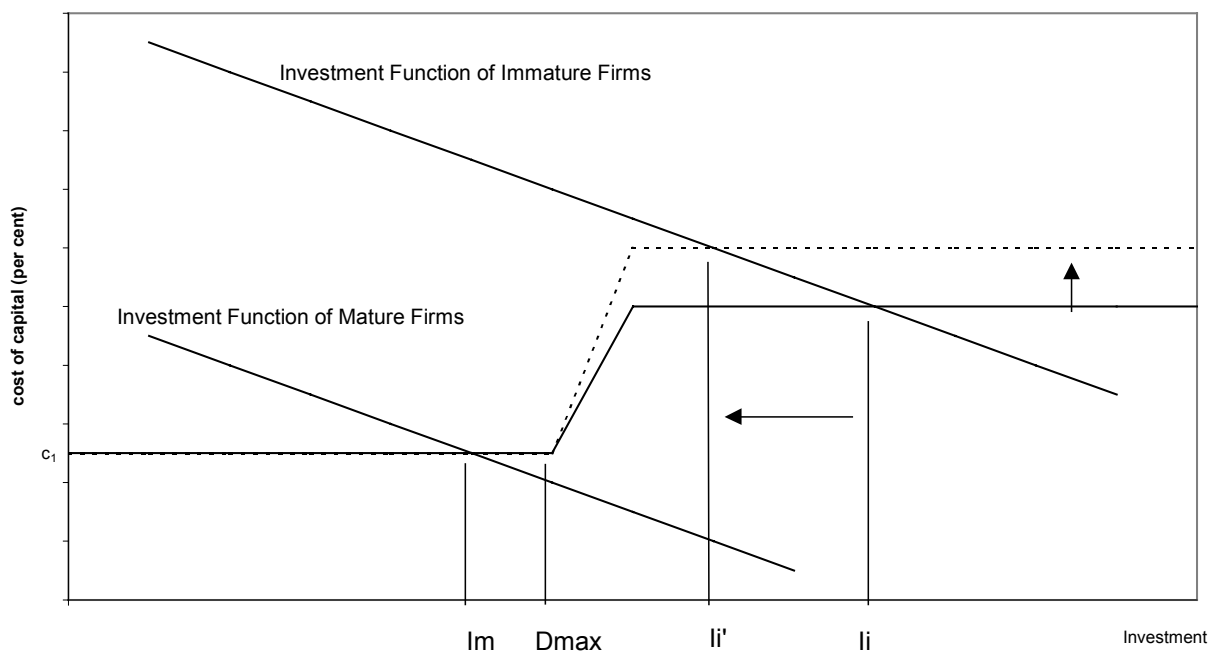
Under the US system and that prevailing in the UK since 1997, it does not pay for companies to issue new shares and pay out the proceeds as dividends since this merely recycles shareholders’ cash back to them while incurring a gratuitous tax liability in the process. As such, cash rich ‘mature’ companies could minimise dividend payments by financing investment out of retained profits and not issuing new shares. Dividends would then be paid out of residual cash flows since there would be no better use for the available funds. The cost of capital would then be independent of dividend taxes since these have an offsetting effect on the net outlay and return on investment. However, cash poor ‘immature’ companies, unable to pay negative dividends, would have a higher cost of capital reflecting the higher cost of new equity finance that comes about because there is no dividend income tax saved on the outlay on investment while the subsequent return will ultimately be taxed. This higher cost of capital would be reflected in a

⁽⁴⁾ The model is outlined more formally in Benito and Young (2001).

lower rate of investment for given investment opportunities as illustrated in Figure 1 which, for now, ignores the possibility of debt finance.

Figure 1 shows the cost of capital function for firms with available cash flow of D_{max} ; it is higher to the right of D_{max} since investment in excess of this level needs to be financed by expensive new share issues. Thus, for mature firms, with investment intentions low relative to cash flow (as shown by the investment function closer to the origin), desired investment (at I_m) can be funded out of the available cash flow with the residual funds paid out as a dividend ($D_{max} - I_m$). But for immature firms, with high investment intentions relative to cash flow (as shown by the investment function further from the origin), investment of more than D_{max} (at I_i) would require that new shares are issued. As such the cost of capital is higher and investment spending lower than it would have been had the firms cash flow been stronger.

Figure 1: Dividends, Investment and the Cost of Capital



This model can be used to examine the effects of changes in the UK tax system announced in the July 1997 Budget. Until then, tax exempt institutions could claim back the tax credit payable on dividend income. Since a dividend payment of £800 at the time attracted a tax credit of £200, the abolition of payable tax credits had a substantial effect on the attractiveness of dividend income from their perspective. Until 1997, in contrast to the US position, this system had given UK

companies the incentive to issue new shares and use the proceeds to pay out dividends to the maximum extent possible. The fact that new share issues were not a significant source of investment finance suggests that transactions or other costs outweighed the tax advantage. In this case, new issues would have been used by companies facing either low transactions costs or binding dividend constraints. This latter group would include 'immature' companies whose investment opportunities are large relative to the amount of profit they generate.

The changes to the UK tax system that eliminated the tax credit for pension funds had the effect of making the system more like that in the US.⁽⁵⁾ The main effect of the change would have been to reduce any incentive to issue new shares. But since this was relatively unimportant prior to the tax change, it is likely to have had relatively little effect on corporate behaviour. The reduction in tax credits would have raised the cost of capital of those companies using new share issues as the marginal source of finance. This is shown in Figure 1 in the upward shift in the user cost of capital function to the right of the point where dividends are available to finance investment (D_{max}), shown by the dotted line. According to the model, the main effect of the change in tax credits would have been on immature companies who needed to issue equity to fund expansion. Since these companies would not have been paying dividends in the presence of the tax credit, the change would not have affected their dividend payments although it might have reduced their investment spending (from I_i to I'_i).

Taking account of borrowing does not substantially change these conclusions. When there is a tax disadvantage to dividend payments, companies could use any excess cash flow to build up assets or run down debt instead of paying dividends, but this would merely postpone the question of how to avoid the dividend tax. In fact, optimal indebtedness is also a function of relative tax rates and dividend constraints and there are many circumstances where financial

behaviour would tend to encourage greater indebtedness and exacerbate the problem in the short term.

Empirical Implications of the Model

As stated, the model provides a framework for an empirical investigation of dividend behaviour. It does not point to a particular equation that could be estimated since this depends on relative taxes and which constraints are binding. Nevertheless, it suggests a range of factors that should be expected to affect the level of dividend payments and the choice of whether a dividend is paid at all. These include measures of profitability or cash flow, investment and investment opportunities and indebtedness. These can be used to motivate the subsequent empirical investigation of dividend behaviour. In summary, the following predictions emerge from the model:

1. Under the current UK tax system, dividends would be paid only when there is no cheaper way of distributing cash to shareholders. Companies would not issue new shares and pay dividends at the same time. But companies with large cash flow relative to investment opportunities are less likely to omit dividends, because of the absence of more tax efficient means of returning cash to shareholders. The 1997 tax reform would have had no effect on the propensity of such companies to pay dividends.
2. Investment opportunities as well as the current level of investment might have some independent power in explaining dividends. As in Fama and French (2001), these can be proxied by a Tobin's average q measure, the ratio of market value of the company to replacement cost of capital. For given investment opportunities, dividend-paying companies will invest more than those omitting dividends reflecting their lower cost of capital.

⁽⁵⁾ Recent changes to UK corporate taxation are summarised in Dilnot *et al* (2001), pages 75 – 78.

3. In the short term, an increase in indebtedness could finance an increase in dividends, but in the longer run a higher level of debt will be associated with higher interest payments and lower dividends. When borrowing constraints bind, corporate dividend policy is largely dictated by the amount firms can borrow. But when debt is more freely available, changes in dividend payments are ultimately the main means by which companies can adjust their balance sheets.

In addition, a range of other factors, not included explicitly within the model, are likely to be important determinants of dividend policy:

1. Firm size is likely to be important, although this is an empirical issue. According to some arguments, agency problems and issues of signalling are expected to be more important for larger firms suggesting that such firms may be less likely to omit a dividend for a given financial situation. Conversely, small firms might put less weight on dividend signals if there is a high fixed cost of state verification.
2. There may also be some inertia to corporate dividend behaviour. Firms may be reluctant to depart from previous levels of dividend payments because of fears about how such a move might be interpreted. This would be consistent with the well-known Lintner (1956) model which demonstrated the importance of dividend smoothing. This has implications for the speed of balance sheet adjustment following shocks.

The model as described has not taken account of a number of alternative factors that might also influence corporate dividend policies for a given set of financial characteristics. These include changes in the perception that shareholders need dividend income and the possibility that improvements in governance institutions might lessen the need for dividends as a disciplining device. But, as in Fama and French (2001), their merit will be assessed by default in the

empirical estimation (see below). It should also be noted that although we are able to shed light on the effects of the 1997 tax credit change, the paper does not aim to evaluate fully the consequences on distributions of that tax change. Instead the paper aims more generally to identify the factors underlying the propensity for companies to omit versus pay a dividend and the propensity to cut versus maintain their dividend.

3 Data, Estimation and Results

Data Description

The data employed are derived from company accounts held on Datastream, the on-line service covering all companies quoted on the London Stock Exchange (LSE). Data for all non-financial companies, including those that subsequently failed, merged or de-listed, were obtained for the period 1974 to 1999.⁽⁶⁾ The total number of companies for which dividend data are available during this period is 2,963, the number of company-year observations being 34,236. The annual sample size is at a low of 1,130 in 1992 and a high of 1,366 in 1997.

Figure 2 illustrates the proportion of companies omitting a dividend.⁽⁷⁾ The proportion increased significantly during the recessionary periods. For instance, in 1979, the proportion of dividend-omitting companies stood at 5.4 per cent but this increased to 16.1 per cent by 1982. The proportion has also increased quite remarkably since 1995, increasing from 14.3 per cent to 25.2 per cent by 1999. Against a background of economic growth over this period this might seem rather surprising.⁽⁸⁾⁽⁹⁾

⁽⁶⁾ We used Datastream's lists of all live and dead UK companies for this purpose. Dead companies include those that subsequently failed, merged or de-listed.

⁽⁷⁾ Further data analysis, considering the cross-sectional distribution of the level of the dividend normalised on company profits (the payout ratio) and on company sales and how these vary over time, is presented in Benito and Young (2001).

⁽⁸⁾ Bond *et al* (1996) state that dividend omission in the UK is not common, with less than 6% of their sample, for the period 1970-90, paying zero dividends. In the data used here, for the period 1974-1990 the proportion is 9.7%.

Figure 2: Quoted UK companies omitting a dividend

Proportion

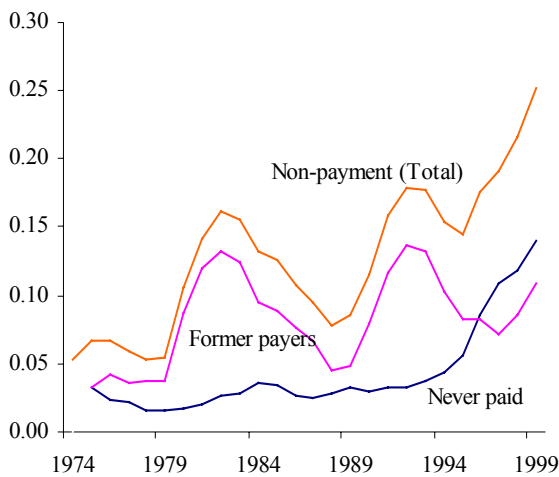
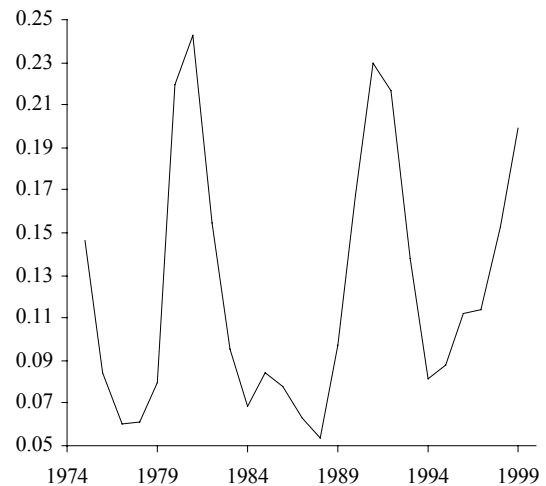


Figure 3: Companies cutting the dividend on the previous year

Proportion



We can distinguish companies that have never paid a dividend (ie. in their available history since 1974) from those that did not pay a dividend in year 't' but at one time prior to year 't' did pay a dividend. Figure 2 shows that the increases in omission in the recessions are accounted for by former payers, no longer paying a dividend. The increase since 1995 however, is largely accounted for by the increasing presence of companies that have never paid dividends. From 1994, the proportion that have never paid a dividend has increased from 4.4 per cent to 14.0 per

In covering all quoted companies it is expected that our data have greater coverage of smaller quoted companies and size is inversely related to the propensity to omit a dividend. The analysis here also suggests that the statement that zero dividend companies are not common, no longer holds.

cent. This suggests that the recent decline in the incidence of dividend-paying companies is different in nature to that which occurred during the two recessions.

In 1995, the Alternative Investment Market (AIM) was created and relaxed the listing requirements for smaller firms relative to the previous Unlisted Securities Market (USM). As such, the size distribution of firms has become somewhat more skewed towards smaller firms (Benito and Vlieghe, 2000). From 1994, the 10th percentile of the distribution of real sales (1995 prices) fell from £8.4mn to £4.2mn in 1999. The median over this period, fell from £63.6mn to £55.2mn but the 90th percentile varied only marginally. There is also a steady increase in new listings between 1994 and 1997, increasing from 0.023 in 1992 to 0.105 in 1997, from which point it has fallen back. The increase in new listings since 1994 is similar to that which occurred in the mid-1980s.

One other relevant factor might be the greater use of share buy-backs as a way of returning cash to shareholders. In 2000 Q1 to Q3, share buy-backs by private non-financial corporations amounted to £7.1 billion, compared with £49.3 billion of domestically paid dividends (*Economic Trends*, February 2001, p.45). Looking at a sample of individual quoted companies in 2000, while 9.0 per cent repurchased shares, only 1.7 per cent of companies omitting a dividend also repurchased their shares.⁽¹⁰⁾ This suggests that companies have not simply substituted payouts as repurchases in place of dividends. This is consistent with some US evidence that suggests that companies use repurchases to distribute temporary cash flows, whereas dividends are used for what are believed to be more permanent distributions (Jagannathan *et al*, 2000).

⁽⁹⁾ Independently, a recent paper by Lasfer (2001), examining data on quoted UK companies over the period 1989-99 also finds an increase in the proportion of dividend omitting companies.

⁽¹⁰⁾ These data, which were available for each share repurchase transaction in 2000, were obtained from the London Stock Exchange. The number of companies undertaking a repurchase was 348, but most of these were financial companies leaving 145 quoted non-financial companies carrying out a buyback in 2000. We matched these data to company accounts data available on Datastream. We were able to match financial data to 103 companies that carried out a repurchase, but also obtained data for the remaining 1,016 non-financial companies on Datastream.

Figure 3 presents the proportion of companies cutting their nominal dividend.⁽¹¹⁾ The proportion of cuts increased notably during the two recessionary periods and also in the period since 1995. In the raw data there is evidence of nominal stickiness in dividend payments. It is quite common for companies to report the same nominal dividend in successive years.

What has happened to the financial characteristics identified in Section 2, over this period? Most notably, the lower tail of the distribution of profitability declined from 1995 (Benito and Vlieghe, 2000). For instance, the number of companies making negative pre-interest profits increased from a low-point of 64 in 1988 to 160 in 1992 from which point it fell to 119 in 1994. Since 1994 the number of loss-making quoted companies has increased markedly reaching 217 in 1999, representing 16.9 per cent of companies, compared to 9.7 per cent of companies in 1994. As noted above, the distribution of real sales also moved somewhat towards smaller companies from 1994/95. This is also expected to be associated with an increase in the incidence of dividend omission, *ceteris paribus*.

Non-payers of dividends are significantly smaller in size, with average sales (1995 prices) of £93mn of those not paying dividends compared to £530mn for dividend-payers. The average sales of companies that have never paid a dividend are smaller still, at £49.6mn for the 1995-99 period. Tobin's Q is also significantly higher amongst companies that omit a dividend and again higher on average for the never paid a dividend group, suggesting that they have greater investment opportunities on average (see Benito and Young, 2001, for further summary statistics).

⁽¹¹⁾ See Benito and Young (2001) for a description of dividend cuts in real terms. In the high inflation years of the mid-1970s, a high proportion of companies cut their real dividend year-on-year. As expected, the more recent sharp increase in the proportion of companies cutting their nominal dividend is more modest when considered in real terms. The proportion of such companies increased from 17.5 per cent in 1994 to 28.1 per cent in 1999.

Estimation Method

We model binary dividend ‘events’, considering both dividend omissions and cuts. For dividend omission, the outcome, y_{it} , is whether the firm omits a dividend ($y_{it}=1$) or not ($y_{it}=0$). This is represented by the following:

$$y_{it} = 1 \left\{ \delta y_{it-1} + X_{it}' \beta + \alpha_i + \varepsilon_{it} > 0 \right\} \quad (6)$$

where ‘i’ indexes companies $i=1..N$ and ‘t’ indexes years, $t=1..T$. α_i denotes the unobserved company-specific component that is assumed random across companies with $\alpha_i \sim N(0, s_\alpha^2)$. $\varepsilon_{it} \sim N(0, s_\varepsilon^2)$ represents random error and is assumed to be independent of α_i . α_i and ε_{it} are also assumed orthogonal to the set of covariates, X , with associated parameter vector β . Dividend omission is observed when the index function $(X_{it}'\beta + \alpha_i)$, (where X_{it} is defined to include the lagged dependent variable, y_{it-1}) crosses a threshold which is here normalised to zero. The probability that this happens is normally distributed. The within-company correlation ρ indicates the proportion of the total variance that is accounted for by the panel variance component, α_i . Under the testable restriction that $\rho = 0$, the model collapses to the pooled cross-sectional probit model. Estimation is by maximum likelihood.⁽¹²⁾

The inclusion of the lagged dependent variable, y_{it-1} , captures any tendency that may exist for companies that have paid a dividend in one year to continue to do so, perhaps for signalling reasons. Heckman (1981a) distinguishes between ‘pure state dependence’ and ‘spurious state dependence’. Pure state dependence refers to the notion that the act of having made a dividend payment/omission last year increases the subsequent probability of doing so. Spurious state dependence reflects the point that companies may differ, in unobservable ways that are persistent, in their propensity to experience the event. We attempt to control for the latter

⁽¹²⁾ See STATA manual (StataCorp, 2001) or Arulampalam (1999) for the likelihood function.

through the random effects term, and by conditioning on relevant financial characteristics, X . By comparison, the Fama and French (2001) study of US companies does not allow for state dependence or unobservables.⁽¹³⁾

We estimate the models described above for data up to end-1994. We then wish to assess to what extent the subsequent increase in non-payment reflects company characteristics as opposed to a declining propensity, for given characteristics, to omit a dividend. We calculate a predicted proportion of omission (ie. the mean predicted probability) based on the predicted probabilities

$$Z_t = \frac{\sum_{i=1}^N (\Phi(X'_{it} \hat{\beta}))}{N}$$

where $\Phi(\cdot)$ is the cumulative standard normal distribution. The difference between this proportion and the actual proportion of companies that omit a dividend then reflects a changing propensity to pay for given characteristics. Since the mean predicted proportion of companies omitting may differ from the actual proportion, in practice we are interested in the profile of ‘ Z ’ over time and the profile of its deviation from the actual proportion.

Estimation results

Tables 1 and 2 contain results from estimation of the random effects probit models for the probability of a dividend omission and a dividend cut respectively. Our regressor set consists of

⁽¹³⁾ We relax several of these assumption considering the robustness of the results by estimating linear probability models with fixed effects estimated using the GMM estimator of Arellano and Bond (1991). This allows for arbitrary correlation between the unobserved heterogeneity and explanatory variables and relaxes the strict exogeneity assumption. Such estimates are also robust to heteroskedasticity, their major drawback being that the predicted probabilities are not bounded by the unit interval. The results, discussed in detail in Benito and Young (2001) suggest that the results are robust to these factors. One further issue, concerning the inclusion of the lagged dependent variable is the initial conditions problem. This occurs when the first period for which we observe an outcome is not the beginning of the underlying process (see Heckman, 1981b). In our case, we have known starting dates (that is, since listing) for 57.3 per cent of the companies. In addition, the time dimension of the panel, at $\max(T) = 26$, is relatively large, and should improve the performance of the RE estimates of δ further. As well as benefiting from the large T aspect of our data it should be noted that the GMM linear probability models with fixed effects avoid this initial conditions problem (Hyslop, 1999).

a lagged dependent variable, (y_{it-1}), cash flow, (CF/K), leverage, (B/MV), investment opportunities, (Q), actual investment, (I/K), and a scale term, the log of real sales, (s). The subsequent specifications consider alternative terms in place of the cash flow term that are functions of profits, namely, return on capital, (π/K) and interest gearing, (IP/π). A final specification in column 4 (column 5 in Table 2) omits the lagged dependent variable for comparison. In the first instance, these same specifications are used for both the probability of dividend omission and a dividend cut.

The relationship between the propensity to omit a dividend and the financial characteristics are generally consistent with the discussion in Section 2. A high level of cash flow lowers the probability of omitting a dividend whilst a high level of leverage increases the probability significantly. Investment opportunities are also positively related to the propensity to omit a dividend, as expected. Given investment opportunities, high actual levels of investment are inversely related to the propensity to omit a dividend. Non-payers are more likely to be on the higher part of the investment supply schedule, doing less investment than their dividend-paying counterparts. In column 3, the interest gearing variable is used in place of the cash flow or profitability term, reflecting the financial pressure arguments of Nickell and Nicolitsas (1999). It suggests that companies facing financial pressure in terms of large debt service payments relative to earnings are significantly more likely to omit a dividend payment. The results uniformly indicate that larger companies are less likely to omit a dividend payment than smaller companies, controlling for other characteristics. This is consistent with the notion that agency and signalling issues are more important for larger firms. The importance of permanent unobserved heterogeneity is indicated through the significance of the ρ term (which, as would be expected, is quantitatively more important when the lagged dependent variable is omitted).

Turning to the propensity for a company to cut its cash dividend this shares many of the same qualitative features to the dividend omission case. Companies with high levels of cash flow are less likely to cut their dividend, while high levels of leverage increase the probability. A high level of investment is negatively related to the probability of cutting the dividend. This may be because companies undertaking high levels of investment are quite confident about their future prospects and are thereby less likely to cut the dividend. An increase in Q is also negatively related to the probability of a dividend cut. Companies with high levels of Q are reckoned by the market to have good financial prospects and, while they have a higher demand for funds, and as a result a greater propensity to omit, also feel they can maintain a given dividend when it is being paid. This may account for the opposite sign on the Q term to that estimated in the dividend omission equation.

Persistence in these dimensions of companies' dividend policies is discussed below. At this point, note that an estimate (standard error) on the lagged dependent variable of 2.065 (0.052) for dividend omission compares to 0.441 (0.033) for a dividend cut.

It is not clear that for the dividend cut models the explanatory variables should be considered in levels rather than differences. This is considered in column 4 that reports estimates for a model that includes all regressors in both levels and differences. The coefficients on the differenced variables have the same sign as their levels counterparts, with the latter remaining quite similar to the estimates when the differenced terms are omitted (column 1). Inter alia, these results suggest that reductions in cash flow and increases in gearing increase the probability of cutting the dividend in addition to effects resulting from a low level of cash flow and high leverage.

Table 3 reports the marginal effects of the different characteristics in levels. An interesting feature of these results is the fact that the marginal effects of characteristics such as cash flow,

(and profitability), income gearing and leverage are greater for dividend cuts than dividend omission. This suggests that a dividend cut is a stronger sign of companies facing financial pressure than dividend omission. An increase in cash flow of 10 percentage points reduces the probability of dividend omission by 0.01 (ie. $-0.104/10$), whilst an increase in leverage of the same amount increases the probability of dividend omission by 0.004. Since the mean proportion of dividend omission up to 1995 is 0.11, these are by no means small effects.

Table 4 considers in greater detail the issue of state dependence. The raw data probabilities for both dividend omission and dividend cut are reported as well as these probabilities given that the firm omitted or cut its dividend the previous year. For both outcomes there is significant evidence of persistence, but this is stronger in the case of omission. The overall proportion of dividend omission is 0.110, for the pre-1995 samples. Among those that omitted a dividend payment in the previous year, the probability, at 0.764, is considerably greater than 0.036 for those that paid a dividend in the previous period. A raw probability of a dividend cut amongst the companies that cut their dividend in the previous year of 0.292, compares to a figure of 0.097 for those that did not cut their dividend. Not surprisingly, the evidence of state dependence is reduced when including the controls for other characteristics. Including these controls, we find a reduction in the predicted probability, conditional on having been a dividend ommitter in the previous year to 0.368, with a probability for those that paid a dividend in the previous year of 0.016. In the case of a dividend cut, the probability of cutting a dividend given that the dividend was cut the previous year is 0.160, compared to a probability of 0.075 if the dividend was not cut the previous year, controlling for financial characteristics. This continues to indicate persistence in dividend cutting behaviour with companies being averse to making the complete adjustment in a single period. This is consistent with Lintner's (1956) notion of partial adjustment.

The increasing incidence of dividend omission from 1995

Table 5 reports the implied proportions of firms with zero payout given two specifications reported in Table 1, alongside the actual proportion observed. These expected proportions use the parameter estimates based on data up to 1994 alongside the values for the financial characteristics of quoted UK companies from 1995 onwards. For discussion, we focus on a model with the lagged dependent variable omitted (column 2), although the results which include the lagged dependent variable are also shown. The preferred model tracks the observed increase in the proportion of dividend omitters quite well. The predicted proportion increases from 0.102 in 1994 to 0.168 in 1999, compared to an actual increase from 0.153 to 0.252. Although the level of dividend omission is underpredicted somewhat, the proportionate increase from 1995 is fully accounted for. Table 5 also assesses the individual contribution of the financial characteristics in accounting for the increase in omission. The results suggest that changes in profitability and size of quoted firms are the single most important factors.

We consider one alternative way of examining the role of financial characteristics versus common macro changes in accounting for the increasing incidence of omission from 1995. The base model is re-estimated over the whole sample period up to 1999, and in Figure 4 we present the estimated year effects. The year effects will pick up common macroeconomic influences across companies. This should include the effects of the tax credit changes in 1997. Note however, that whilst the post-1995 dummies are jointly significant ($\chi^2(5)=24.34$; p-value=0.00), several of the individual year-on-year differences are insignificant. For instance, the restriction that the 1996 and 1997 effects are equal cannot be rejected ($\chi^2(1)=0.43$; p-value=0.51). The best that can be said is that there is evidence of common effects at work post-1995 but they do not seem to be large relative to the increase in omission that has been observed (see Figure 4) and

our analysis is unable to identify whether any year effects are specifically due to the tax change.⁽¹⁴⁾

4 Conclusions

This paper has examined the incidence of dividend omission and dividend cuts among quoted UK firms. The paper has produced several novel results.

First, an increase in the proportion of quoted UK companies that omit a dividend from 1995 has been identified. This pronounced trend is not well known. In 1995, the proportion of non-payers stood at 14.3 per cent and reached 25.2 per cent in 1999. Earlier high-points of omission were 16.1 per cent and 17.9 per cent, witnessed in 1982 and 1992 respectively, both periods of recession. This increase in dividend omission since 1995 is largely accounted for by an increase in the proportion of companies that have never paid a dividend, contrasting with previous increases during recessions, accounted for by an increase in the proportion of former-payers that elected to omit a dividend.

For the most part these companies that have never paid a dividend are relatively small companies with strong investment opportunities. It might be felt then that the recent increase in dividend omission is less worrying than in previous periods when the dividend omitters were former payers who were attempting to repair their balance sheets. In this sense, the changes we

⁽¹⁴⁾ We also estimated a model for the full sample period that included interaction terms between a post-1995 (or post-1997) dummy variable and each of the explanatory variables. A test of the joint significance of the interaction terms constitutes a test of a difference in the responsiveness of the propensity to omit to the financial characteristics. The post-1995 year dummies indicate whether there is evidence of a common shift effect in the propensity to omit a dividend. The interaction terms were jointly significant ($\chi^2(5)=65.14$; p-value=0.00). This was driven by a smaller absolute sensitivity to cash flow (coefficient (standard error) on the interaction term of 1.011(0.219)), investment (0.416(0.112)) and smaller sensitivity to leverage (coefficient and standard error on the interaction term of -0.342(0.120)).

have identified reflect 'Great Expectations' rather than 'Hard Times'. Despite this comforting conclusion, the evidence suggests that it is low levels of profitability among dividend omitting companies that is the single most important factor accounting for the increase. As such, concerns may remain until the investment opportunities are converted into higher profitability.

Second, the paper has shed light on what characteristics are associated with a dividend omission and dividend cut. Low levels of cash flow, high levels of income gearing and leverage, small scale and greater opportunities for investment are all associated with an increased propensity to omit a dividend. These factors, in particular those of cash flow and leverage, are more strongly related to the propensity to cut the dividend. This suggests that a dividend cut is a stronger indicator of financial fragility than a dividend omission.

Third, the paper has used these results to account for the observed increase in dividend omission. The analysis indicated that these characteristics could account for much of the increase in the proportion of zero-payout firms. This implies that there is a more limited role for a change in dividend policies *per se*, controlling for changes in the characteristics of firms, although we do find evidence of a change in the responsiveness of omission propensities to financial characteristics for the post-1995 period. There is relatively little evidence to link the increase in omission to the major tax reform of 1997 that abolished tax refunds on dividend income payable to tax exempt institutions.

Fourth, we also considered a role for state dependence in the incidence of dividend omission and the results indicate that the propensity to omit is highly persistent, controlling for financial characteristics and unobserved heterogeneity. In considering the incidence of dividend reduction, there was also evidence of state dependence, albeit less strong than for dividend omission. We interpret this as consistent with Lintner's (1956) notion of partial adjustment of dividend

payments. Companies are unwilling to adjust their dividend payment fully in the light of financial pressure but instead have regard for target payouts. This also has implications for companies' investment policies since it makes it more likely that some of the adjustment to a balance sheet shock will come through real outcomes such as employment or investment.

Table 1: Random effects probit models for dividend omission

| | [1] | [2] | [3] | [4] |
|------------------------------|----------------|----------------|----------------|----------------|
| y_{it-1} | 2.065 (0.052) | 2.128 (0.052) | 2.195 (0.050) | |
| $(CF / K)_{it}$ | -3.229 (0.136) | | | -3.853 (0.163) |
| $(\pi / K)_{it}$ | | -7.282 (0.269) | | |
| $(IP / \pi)_{it}$ | | | 0.470 (0.014) | |
| $(B / MV)_{it}$ | 1.238 (0.068) | 1.080 (0.069) | 0.942 (0.068) | 1.448 (0.073) |
| (I_{it} / K_{it-1}) | -0.544 (0.061) | -0.531 (0.065) | -0.497 (0.060) | -0.731 (0.068) |
| Q_{it} | 0.086 (0.009) | 0.051 (0.008) | 0.005 (0.006) | 0.068 (0.010) |
| $(I_{it} / K_{it-1})/Q_{it}$ | | | | |
| S_{it} | -0.259 (0.018) | -0.227 (0.018) | -0.246 (0.018) | -0.513 (0.026) |
| Year effects | Yes | Yes | Yes | Yes |
| Log-likelihood | -3052.585 | -2892.143 | -2771.769 | -3795.737 |
| S_{α} | 0.538 (0.046) | 0.542 (0.047) | 0.478 (0.044) | 1.411 (0.047) |
| ρ | 0.225 (0.030) | 0.227 (0.030) | 0.186 (0.028) | 0.666 (0.015) |
| Companies | 2,101 | 2,096 | 2,097 | 2,101 |
| Observations | 21,906 | 21,886 | 21,885 | 21,934 |

Notes: Estimated over the period 1974-1994. Standard errors in parentheses. $\rho=0$ is the restriction implied by the pooled probit estimator against the random effects probit. s_{α} is the standard deviation of the panel component, α . See Data Appendix for variable definitions.

Table 2: Random effects probit models for dividend cut

| | [1] | [2] | [3] | [4] | [5] |
|-----------------------------|----------------|----------------|----------------|----------------|----------------|
| y_{it-1} | 0.441 (0.033) | 0.381 (0.034) | 0.311 (0.035) | | |
| $(CF / K)_{it}$ | -1.166 (0.075) | | | -0.798 (0.089) | -1.396 (0.077) |
| $(\pi / K)_{it}$ | | -3.323 (0.146) | | | |
| $(IP / \pi)_{it}$ | | | 0.230 (0.009) | | |
| $(B / MV)_{it}$ | 0.715 (0.037) | 0.607 (0.037) | 0.562 (0.037) | 0.767 (0.043) | 0.823 (0.039) |
| (I_{it} / K_{it-1}) | -0.305 (0.054) | -0.242 (0.054) | -0.296 (0.054) | -0.221 (0.081) | -0.356 (0.050) |
| Q_{it} | -0.014 (0.006) | -0.020 (0.006) | -0.040 (0.006) | -0.053 (0.009) | -0.014 (0.006) |
| S_{it} | -0.075 (0.008) | -0.048 (0.008) | -0.054 (0.008) | -0.071 (0.009) | -0.080 (0.009) |
| $\Delta(CF / K)_{it}$ | | | | -1.771 (0.098) | |
| $\Delta(B / MV)_{it}$ | | | | 0.196 (0.046) | |
| $\Delta(I_{it} / K_{it-1})$ | | | | -0.319 (0.045) | |
| ΔQ_{it} | | | | 0.014 (0.012) | |
| ΔS_{it} | | | | -0.425 (0.059) | |
| Year effects | Yes | Yes | Yes | Yes | Yes |
| Log-likelihood | -6131.003 | -5982.188 | -5944.083 | -5868.517 | -6870.657 |
| S_{α} | 0.001 (0.000) | 0.001 (0.000) | 0.001 (0.000) | 0.298 (0.025) | 0.372 (0.024) |
| ρ | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.082 (0.013) | 0.122 (0.014) |
| Companies | 1,972 | 1,967 | 1,968 | 1,969 | 2,101 |
| Observations | 19,846 | 19,820 | 19,818 | 19,813 | 21,906 |

Notes: as for Table 1.

Table 3: Marginal effects

| | [1] | [2] | [3] | [4] | [5] | [6] |
|--------------------------|--------|--------|--------|--------|--------|--------|
| <i>Dividend Omission</i> | | | | | | |
| y_{it-1} | 0.352 | 0.341 | 0.336 | | | |
| $(CF / K)_{it}$ | -0.162 | | | -0.227 | | |
| $(\pi / K)_{it}$ | | -0.336 | | | -0.559 | |
| $(IP / \pi)_{it}$ | | | 0.025 | | | 0.041 |
| $(B / MV)_{it}$ | 0.062 | 0.050 | 0.049 | 0.085 | 0.075 | 0.081 |
| $(I / K)_{it}$ | -0.027 | -0.025 | -0.026 | -0.043 | -0.028 | -0.033 |
| * Q_{it} | 0.433 | 0.234 | 0.024 | 0.398 | 0.423 | 0.066 |
| S_{it} | -0.013 | -0.010 | -0.013 | -0.030 | -0.024 | -0.031 |
| <i>Dividend Cut</i> | | | | | | |
| y_{it-1} | 0.085 | 0.084 | 0.085 | | | |
| $(CF / K)_{it}$ | -0.178 | | | -0.204 | | |
| $(\pi / K)_{it}$ | | -0.496 | | | -0.552 | |
| $(IP / \pi)_{it}$ | | | 0.037 | | | 0.041 |
| $(B / MV)_{it}$ | 0.109 | 0.091 | 0.090 | 0.126 | 0.103 | 0.099 |
| $(I / K)_{it}$ | -0.047 | -0.036 | -0.047 | -0.054 | -0.043 | -0.050 |
| * Q_{it} | -0.211 | -0.303 | -0.631 | -0.239 | -0.324 | -0.605 |
| S_{it} | -0.012 | -0.007 | -0.009 | -0.012 | -0.007 | -0.009 |

Notes: The table reports marginal effects of a unit change on the probability of observing $y_{it}=1$ evaluated at the means, with the exception of the effect of y_{it-1} which considers the change in the probability for a discrete change in last period's outcome. * denotes effect multiplied by 100. The marginal effects for the continuous explanatory variables are calculated as $\frac{d[\text{prob}(y=1|x)]}{dx_k} = \phi(\bar{x}\beta\sqrt{1-\rho})\sqrt{1-\rho}\beta_k$ where $\phi(\cdot)$ is the standard normal

density function, \bar{x} is the vector of mean characteristics, β the vector of coefficient estimates with β_k the coefficient estimate on regressor x_k (see Arulampalam (1999) on the adjustment to the standard expression for marginal effects by the $\sqrt{(1-\rho)}$ correction factor in a random effects probit model).

Table 4: Raw data and Predicted Probabilities by Previous State

| | Dividend Omission | Dividend Cut |
|---|-------------------|--------------|
| <i>Raw data probabilities</i> | | |
| Unconditional | 0.110 | 0.121 |
| i) Given dividend omission/cut, t-1 | 0.764 | 0.292 |
| ii) Given dividend payment/non-cut, t-1 | 0.036 | 0.097 |
| i) - ii) | 0.728 | 0.195 |
| <i>Predicted Probabilities holding characteristics constant</i> | | |
| i) Given dividend omission/cut, t-1 | 0.368 | 0.160 |
| ii) Given dividend payment/non-cut, t-1 | 0.016 | 0.075 |
| i) - ii) | 0.352 | 0.085 |

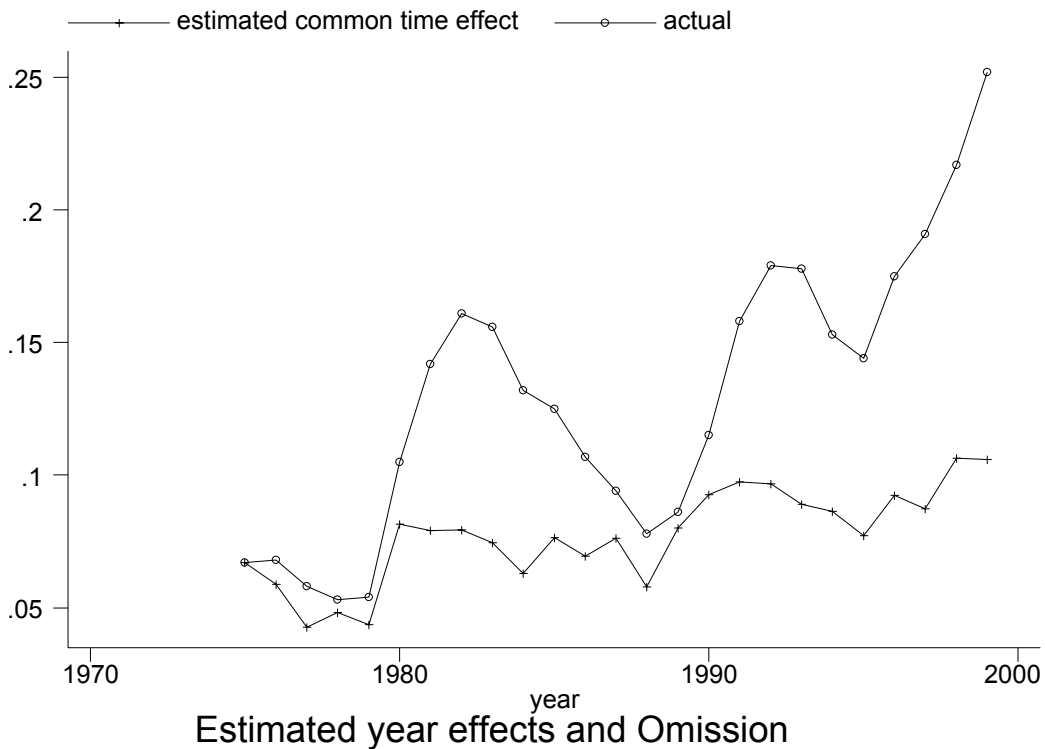
Note: Predicted probabilities are calculated using the specification shown in column 1 of Tables 1 and 2, evaluated at the means of the data with the previous state set to either 1 or zero.

Table 5: Actual and Predicted Proportions of Dividend Omission

| | Actual | Model 1 | Model 4 | $(\pi / K)_{it}$ | $(B / MV)_{it}$ | $(I / K)_{it}$ | Q_{it} | S_{it} |
|------|--------|---------|---------|------------------|-----------------|----------------|----------|----------|
| 1990 | 0.115 | 0.109 | 0.058 | 0.048 | 0.025 | 0.025 | 0.025 | 0.055 |
| 1991 | 0.158 | 0.147 | 0.099 | 0.092 | 0.054 | 0.053 | 0.056 | 0.094 |
| 1992 | 0.179 | 0.174 | 0.120 | 0.118 | 0.079 | 0.081 | 0.079 | 0.120 |
| 1993 | 0.178 | 0.168 | 0.115 | 0.107 | 0.077 | 0.076 | 0.077 | 0.119 |
| 1994 | 0.153 | 0.140 | 0.102 | 0.089 | 0.057 | 0.053 | 0.055 | 0.098 |
| 1995 | 0.144 | 0.137 | 0.116 | 0.103 | 0.057 | 0.049 | 0.055 | 0.106 |
| 1996 | 0.175 | 0.141 | 0.133 | 0.117 | 0.056 | 0.052 | 0.055 | 0.119 |
| 1997 | 0.191 | 0.158 | 0.135 | 0.112 | 0.055 | 0.057 | 0.055 | 0.130 |
| 1998 | 0.217 | 0.171 | 0.144 | 0.124 | 0.062 | 0.053 | 0.055 | 0.132 |
| 1999 | 0.252 | 0.201 | 0.168 | 0.143 | 0.059 | 0.052 | 0.053 | 0.140 |

Note: Models 1 and 4 refer to the columns in Table 1. The estimates are based on data to 1994. Columns labelled with single explanatory variables give predicted proportion derived from a univariate model with that variable and a set of time effects.

Figure 4



Note: The estimated year effects are shown as marginal effects associated with the year dummies shifted to equal the actual proportion of omission in 1975.

Data Appendix

Variable construction

Dividends (D)

Ordinary dividends net of Advance Corporation Tax. (Datastream Item 187).

Capital stock (K)

Capital stock is measured on a replacement cost basis. The procedure employed to convert the historic cost measure to replacement cost—a perpetual inventory method—has been used in a number of company accounts panel data studies (eg. Blundell *et al.*, (1992); see Benito and Young (2001) for more details).

Profits (π)

Earnings before interest and taxes is given as DS157+DS153.

Tobin's Q (Q)

Q is calculated as follows:
$$Q_{it} = \left(\frac{mv_{it} + b_{it} - c_{it}}{K_{it}} \right).$$

where mv is market capitalisation of the company at December 31 in year t (Datastream Item mv); b is book value of outstanding debt (DS321 for loans and bonds repayable in more than one year and DS309 for borrowings repayable within 1 year); c is book value of cash and equivalent (DS375). High values (the top 1%) are recoded to the 99th percentile.

Investment (I)

Fixed investment is measured as the proportionate change in the replacement cost capital stock plus current cost depreciation of fixed assets (DS136). The total new fixed assets item on Datastream (DS435) has been unavailable since 1993.

Cash flow (CF)

Profit after tax and interest payments (DS157 – DS172) plus depreciation of fixed assets (DS136).

Interest gearing (IP/ π)

Interest payments (DS153) divided by profit before tax (DS157) plus interest received (DS143).

Leverage (B/MV)

Net debt divided by market value of assets, where market value is measured by market capitalisation (Item mv) plus net debt and where net debt is equal to total borrowing repayable within a year (Item 309) plus total loan capital (Item 321) less total cash and equivalent (Item 375).

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