Cash Acquirers: Free Cash Flow, Shareholder Monitoring, and Shareholder Returns

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Abstract

Although Jensen (1988) argues that high levels of free cash flow and unused borrowing capacity are likely to encourage low-value mergers, the "pecking order" theory offers a different perspective, where managers conserve cash flow to undertake positive NPV investments. We argue that the stronger position of shareholders, as opposed to firm managers, in the UK compared to the US makes the Free Cash Flow (FCF) hypothesis less likely to be relevant in the UK. In support of this, by analysing both announcement period and long term returns, we show that for a comprehensive sample of UK cash acquirers there is little support for the Free Cash Flow (FCF) hypothesis. Instead, our evidence is consistent with greater shareholder monitoring mitigating any agency problem associated with high FCF. Our results are also consistent with low FCF firms having a greater likelihood of being financially distressed.

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Cash acquisitions are a particularly interesting sub-category of acquisition and merger activity. The evidence, over time and across markets, shows that cash acquisitions appear to exhibit different short term and long term performance from stock-financed or mixed-finance acquisitions (Aggrawal and Jaffe, 2000). Whilst there are differences in findings between markets (e.g. Franks, Harris and Mayer 1988), it is clear that cash-financed acquisitions do not appear to be associated with value-destruction in the same way that stock-financed acquisitions are.

However, whilst it is tempting to conclude that it is simply the form of financing that separates the shareholder value destruction of equity-financed takeovers from cash takeovers, such a conclusion tends to ignore the question of where the cash to fund the acquisition comes from in the first place. Theory tells us this should matter, yet to our knowledge the only paper that has so far investigated this issue is Martynova and Renneboog (2009). Whilst different theories on firm financing offer competing explanations on both managerial choices and shareholder preferences, it seems reasonable to ask the question whether the source of the cash influences the long run wealth effect of any cash-financed acquisition. The most direct hypothesis on this is Jensen's (1988) free cash flow (FCF) hypothesis. Jensen (1988, p. 34) claims that 'free cash flow theory implies that managers of firms with unused borrowing power and large free cash flows are more likely to undertake low-benefit or even value destroying mergers'. Whilst previous studies have tested the FCF hypothesis as it relates to bidders (e.g. the US studies of Lang, Stulz and Walking, 1991 and Doukas 1995; the UK study of Gregory, 2005) these studies have not tested the theory on pure cash acquirers, which is arguably the class of takeover to which Jensen's theory most directly relates. Besides the direct claim that high FCF is likely to lead to poor acquisition investment decisions, Jensen (1986) also argues that firms that pay out free cash flow to shareholders need to subject themselves to monitoring in order to raise finance for major investments, leading to superior investment decisions. In particular, debt financing has a role in reducing agency problems, motivating

organisational efficiency and improving management (Myers and Majluf 1984; Jensen 1986, 1988; Harris and Raviv, 1990; Stulz 1990).

However, in regarding internally generated undistributed cash flows as giving rise to agency problems, and in favouring debt finance, the FCF hypothesis conflicts with alternative theories of capital structure to a greater or lesser extent. Most obviously it is at some variance with the pecking order hypothesis, the static trade-off theory and the "windows of opportunity" theories. Furthermore, the FCF hypothesis to some degree conflicts with the findings from the financial distress literature. Recent evidence from Campbell, Hilscher and Szilagyi (2008), Agarawal and Taffler (2007,2008) and Christidis and Gregory (2010) reminds us that accounting ratio based models show high leverage and low cash (variously measured) are associated with a higher probability of financial distress. This message is perhaps reinforced by the recent financial crisis, where ironically firms that followed the prescriptions of Jensen's FCF hypothesis have been badly caught out.[1] Given these recent events, it seems timely to revisit the FCF hypothesis, and investigate whether high gearing and a low free cash flow are necessarily as desirable as Jensen and others have claimed them to be, particularly when consideration is given to the ability of shareholders to monitor the actions of boards of directors through other means.

This ability of shareholders to mitigate agency problems is at the heart of our investigation. We argue that the studies which find in favour of the FCF hypothesis do so in the context of markets, particularly the US, where managers have relatively strong rights compared to their shareholders. So we investigate the hypothesis in an alternative market where shareholders have stronger rights compared to managers. The market we choose is the UK, a market characterised by a high level of takeover activity, a pattern of substantial institutional shareholding, strong shareholder protection, and severe restrictions on the types of bid defences favoured in the US. Our first hypothesis is that the agency costs of high FCF in such a market will be far lower, so that the potential financial distress costs of higher leverage and lower cash flows may actually be greater than these agency costs. In such a case, far from high

[1] For example, one high profile casualty of the move to gear up and return cash to shareholders has been Philip Yea, former CEO of 3i. ".. investors and analysts said Mr Yea paid the price for worries over 3i's high debt levels, which have driven the share price to record lows. The group returned £2.2bn to investors via share buy-backs in 2006 and 2007 " (Financial Times, 28th January, 2009).

FCF being associated with lower bidder returns, we would expect to see either no effect, or even that high FCF (or lower leverage) predicts better bidder outcomes. Our second hypothesis is that the greater the degree of mitigation (as proxied by institutional ownership) of agency costs, the less high FCF will prove problematic, and the less will be any advantage from high leverage. Note, though, that Jensen's hypothesis also predicts more hostile disciplinary takeovers, and the restrictions on takeover defences in the UK are likely to have some influence in limiting managers' incentives to undertake value-destroying takeovers in the first place.[2]

The paper proceeds as follows. We start with a literature review and the background to the research design, and we go on to describe the data and methodology. Then we begin by investigating whether the source of cash used to finance the acquisition has any bearing on the market's reaction to the bid. In this regard, our analysis is in the same spirit as the investigation performed by Martynova and Renneboog (2009), although the focus of our analysis, and our investigation methods, are rather different. Under the FCF hypothesis, takeovers financed from internal funds should show the worse performance, whilst those funded from debt should show the best performance. In order to directly test the FCF hypothesis, we then examine the market reaction for acquirers classified according to their FCF position. Next, we examine announcement period returns in regression tests that include form of financing and firm-specific control variables. Following Cremers and Nair (2005), we test to see whether institutional shareholding has an impact on the relationship between FCF, leverage and announcement period returns. Finally, we examine the long run returns for acquirers classified according to their source of funding, their FCF position, and their degree of institutional ownership.

Our results are as follows. Both at announcement and over the 60 month post acquisition, high FCF firms out-perform low FCF firms. In contrast to the expectation under the FCF hypothesis, we find that the announcement period return difference between high FCF and low FCF firms is strongest amongst firms using internal finance. Importantly, and consistent with Cremers and Nair (2005), we show that high FCF firms with high institutional shareholdings have returns that are

[2] The authors are grateful to Matt Cain of Notre Dame University for this observation.

increasing in FCF but reducing in terms of leverage, suggesting that good monitoring overcomes any agency problems associated with high FCF. In the long term, we find that low FCF firms have significant negative abnormal returns and that the group of acquirers that do *not* have high FCF and low Q ratios (the particular sub-set of firms that Jensen identifies as the problem group) that out-perform other cash acquirers. We also show that low FCF have higher loadings on both SMB and HML factors than high FCF firms. Our results are consistent with low FCF firms having a greater likelihood of being financially distressed. Furthermore, our announcement period results show that pre-bid gearing has a weak negative association with returns. Whilst our results suggest that institutional monitoring may be capable of mitigating agency effects, they could also be consistent with the UK takeover environment being one where the greater threat of hostile takeovers acts to discipline mangers of high FCF firms.

Literature Review and Background to the Research Design

The clear message from long run studies of acquisitions and mergers is that stock-financed acquisitions under-perform, whilst cash financed acquisitions generally show no abnormal performance (Aggrawal and Jaffe, 2000). Although some studies show evidence that announcement period returns can still be negative for cash acquirers who acquire listed targets, that result seems somewhat model and return window dependent (Draper and Paudyal, 2006), and invariably cash acquirers perform better than equity acquirers (Draper and Paudyal, 2006, 2008). Such results have been described as supporting a "form of financing hypothesis" by Aggrawal and Jaffe (2000). Since that paper the behavioural finance literature has motivated the "behavioural timing" hypothesis of Loughran and Ritter (2000) and the market-driven acquisition hypothesis of Shleifer and Vishny (2003). These hypotheses explain the poor performance of equity-financing acquirers not in terms of poor investment decisions, but in terms of a rational management exploiting the purchasing power of the over-valued equity of their companies. Evidence in support of the Shleifer and Vishny (SV) hypothesis has been found in both the US (Ang and Cheng, 2006; Dong, Hirshleifer, Richardson and Teoh, 2006; Savor and Lu, 2009) and in the UK (Bi and Gregory, 2009). The announcement period evidence in Draper and Paudyal (2008) also provides some support for this hypothesis.

With regard to the extant literature on the FCF hypothesis, the evidence as it relates to takeovers generally supports the hypothesis, although testing the hypothesis is not without its difficulties. In theory, high FCF is only problematic when firms have poor investment opportunities. It is worth reminding ourselves of what Jensen's hypothesis has to say in this respect. High free cash flow is problematic only in cases where the firm has a lack of investment opportunities. Jensen's prediction is that in such circumstances, managers will be tempted to use this free cash flow to undertake value-destroying mergers. The position can readily be summarised as follows[3]:

	Investment Opportunity Set	
Free Cash Flow	**Many positive NPV projects**	**No positive NPV projects**
Low	**Create Value**	**?**
High	**Create Value**	**Destroy Value**

This poses the problem of finding a proxy for the unobservable investment opportunity set. The correct measure of this is the firm's *marginal* Tobin's *q* ratio, i.e. the ratio of present value of its investment opportunity set to the cost of undertaking that investment. Provided $q>=1$, investment is in the interests of the shareholders. Empirical studies have adopted various proxies for this unobservable marginal *q*, including average *q* (market value of equity to replacement cost of assets), current *q* compared to long run average *q*, and a comparison of the firm's book-to-market ratio with its industry mean book-to-market ratio. The argument for using the latter is that it overcomes the problem of "knowledge" assets, particularly important in certain industries, being excluded from the financial statements (e.g. Hall 1998). Gregory (2005) notes that whilst broadly similar results are obtained from all three measures, the latter may be a better proxy for marginal *q*. In the first US investigation of the FCF hypothesis, Lang, Stulz and Walking (1991, hereafter LSW), study a sample of 101 US domestic take-overs over the period 1968-1986 and find

[3] We are grateful to Matt Cain (discussant of an earlier version of this paper at the New York Financial Management Association Conference) for suggesting this diagram.

economically and statistically significant results in favour of the hypothesis. Defining *q* on the basis of market value of assets to replacement cost, they show that low *q*, high FCF firms are the worst performers of any of the sample sub-sets. Support for the FCF hypothesis is also found by Doukas (1995) in a study of the announcement period returns around foreign acquisitions by US firms. In the UK, evidence is both limited and mixed. Both Gregory (2005) and Sudarsanam and Mahate (2006) test the hypothesis using long terms returns. The former reports evidence that contradicts the FCF hypothesis, finding that in the long term high FCF firms perform better than low FCF firms, and that low *q*, high FCF firms are the best performing sub-group over 60 months post acquisition. Whilst Gregory (2005) also looks at announcement month returns, finding that high FCF firms seem to do worse in the announcement month, he does not look at daily returns around announcement. The suggestion in his study is that in the long term, low FCF firms are more prone to distress. Sudarsanam and Mahate (2006) are primarily concerned with an analysis of friendly bids, but they include a cash earnings type measure that they argue proxies for FCF (though they do not categorise firms on the basis of their investment opportunity sets). In contrast to the results in Gregory (2005), Sudarsanam and Mahate (2006) report a negative association between their cash earnings proxy and returns for the one, two and three years post acquisition. They note that their results are consistent with the Jensen FCF hypothesis, although they do not undertake any formal tests beyond a regression including their measure of *q* and their FCF proxy. Whilst all of these studies control for the form of payment, none separately analyse cash acquisitions. This is an important shortcoming, as it is far from obvious why an equity financed takeover should reveal a great deal about the FCF hypothesis. By contrast, a pure cash takeover represents the direct expenditure of a firm's free cash flow.

Critically, the FCF hypothesis assumes that an agency problem exists that can best be overcome by requiring managers to disgorge cash to the shareholders. However, recent work (Gompers, Ishii and Metrick, 2003; Cremers and Nair, 2005) demonstrates that shareholder rights have an important impact on both returns and performance. The former shows that firms with the strongest shareholder rights outperform those with the weakest by 8.5% per annum. Cremers and Nair (2005) shows that a simpler three component measure of shareholder rights, the Alternative Takeover Protection Index (ATI), complements the effect of block shareholdings. We

argue that there are important differences between shareholder rights between the UK and the US that are likely to reduce the agency problems of high FCF. For example, Bush (2005), in the Institute of Chartered Accountants in England and Wales's *Dialogue in Corporate Governance* initiative series notes "the common language of the UK and US can at times create a superficial similarity in both governance and reporting matters, when beneath the surface, the law is entirely different in intent and effect". More bluntly, as Mark Roe, Professor of Law at Harvard University notes in a recent Financial Times article: "*Corporate and securities law in the US already strongly favours managers over shareholders. Usually, it is just fine that shareholders are distant from the corporation and its directors; shareholders don't know the company's business, while directors and managers do. But when directors or executives stumble, American shareholders (in contrast to British and other nations) today have only weak tools to influence or replace the faltering chief executive*."[4] These international differences centre on both aspects of the Cremers and Nair (2005) analysis. First, UK shareholdings are dominated by institutional investors. In the middle decade of our study, the figures in our appendix (Office of National Statistics data and NYSE data) show that UK domestic institutions hold larger proportions of the UK market than is the case for the US. Furthermore, the large pension, unit trust and insurance company shareholdings in the UK are managed by a highly concentrated group of fund managers. Stapledon and Bates (2002, Table 2) show that the top twenty UK fund managers controlled 37.06% of the UK market by value as at the end of 1997. The top three alone controlled just under 11%. We argue that this puts UK shareholders in a far more powerful position relative to management than would be the case in the US. As Gregory and Matatko (2005) observe "In practice, this means that the chances of a bid succeeding without the tacit approval of this fund management group are remote – it is likely that they will be managing equity stakes in both target and acquiring companies, unless these are small and illiquid stocks". Sudarsanam (2000) also notes that "Since, in the UK, large acquisitions require shareholder approval…block shareholders and institutional shareholders are likely to have the opportunity to vet the proposed acquisitions". Second, all of the three ATI measures identified Cremers and Nair (2005), namely staggered boards, restrictions on shareholder voting rights, and "blank checks" (or "poison pills") are virtually

[4] Financial Times, January 25th 2010.

impossible to implement in the UK, because of conflicts with Stock Exchange rules or the operation of the *City Code on Takeovers and Mergers*. In particular, Rule 21 of the *City Code*, "Restrictions on Frustrating Action", specifically rules out any asset sales, security issuance or other devices which may be categorised as "poison pill" measures unless they have been approved by a general meeting of the shareholders. As Sudarsanam (2001) notes, "Poison pills…..are unknown in the UK", and "Equally rare….is a staggered board of directors". Furthermore, in the UK the executive compensation package has to be approved by a majority vote of shareholders and, since the 1992 Cadbury Report, corporate governance structures have been designed to ensure managers act in the best interests of the shareholders. Sudarsanam (2001) highlights the important differences between the UK and US in this regard. We hypothesise that the greater ability of shareholders to exert influence over a firm's managers in the UK leads to free cash flow being far less of a problem than it might be in countries where shareholders have lesser rights over managers.

As we noted in the introduction, to some degree the FCF hypothesis is in conflict with other theories of capital structure. Under the pecking-order theory of Myers and Majluf (1984), managers try to conserve cash in order to make rational investments on behalf of the shareholders. Internal equity is unambiguously better than external equity, and financial slack is desirable under the pecking-order theory. This is diametrically opposed to the order preferences and the view of financial slack put forward in the FCF hypothesis. However, debt issues are second choice in the pecking order theory, so a gearing-increasing transaction would be regarded as more desirable than the use of any other form of external financing. Under a static trade-off theory managers are trying to work towards a long-run target debt:equity ratio, implying that free cash flow may be either conserved, used to retire debt, or paid out to shareholders depending on where the firm is currently positioned relative to its long term target ratio. This theory would predict that the market reaction to financing choice would be contingent on where the firm was positioned relative to its (difficult to observe) long-run optimal gearing level. Under the Loughran and Ritter (1995) "windows of opportunity" hypothesis, managers are reacting to perceived mis-valuations of their firm and targeting the form of financing employed according to their perceptions of relative value. Here any issue of equity should be "bad news" as firms choose equity issuance when equity is over-valued. Managers will opt to issue debt when equity is

under-valued. Loughran and Ritter (1995) and Baker and Wurgler (2000) show that stock returns are low following the issue of equity, and it is well-documented that long run stock returns are low following equity-financed acquisitions (Agrawal and Jaffe, 2000; Agrawal, Jaffe and Mandelker, 1992; Gregory, 1997; Loughran and Vijh, 1997; Rau and Vermaelen, 1998).

Data and Methodology

The sample consists of UK domestic cash financed acquisitions, with both bidders and targets being listed companies traded on the London Stock Exchange. The sample period for the acquisitions is between January 1984 and December 2002. Because the data found in Securities Data Company (SDC) is not wholly reliable, particularly for the earlier years of this study, the sample is selected from data obtained from both SDC and Acquisitions Monthly (AMDATA) database, combined with a cross-check to the *Acquisitions Monthly* publication.[5] The daily stock returns and the return on the FTSE All Share Index are from Datastream's Total Return Index series, while the monthly returns and market capitalisations for each acquirer are taken from the London Business School Share Price Database (LSPD).

The requirements for the research sample are as below:

1. Both acquirer and target firms are listed companies and traded on the London Stock Exchange;
2. The transaction is disclosed and listed as completed; and
3. The transaction consideration is wholly in cash.

Following these criteria, the sample size is 275. In order to eliminate noise caused by large bidders acquiring small targets, a minimum relative size cut-off is imposed: the target's market capitalisation has to be at least 5% of that of the acquirer's. We also require announcement period returns to be available from Datastream, and, as a minimum, for takeover month returns to be available from the LSPD. These criteria reduce the sample size to 169 firms. In order to measure FCF we require financial reports to be available for the year prior to the bid, and we also require financial

[5] Martynova and Renneboog (2009) make similar observations on the reliability of the SDC data.

statements to be available for the combined firm for the year in which the bid takes place in order to calculate the net debt change. A lack of such availability for 11 firms further reduces the sample size to 156. In addition there are 4 sample firms missing data for calculating the takeover premium, which reduces the final sample to 152 firms.

The criterion for determining which type of financing is the "dominant" source of cash is that the fraction of the bid price paid from the financing source must be over 50%. To calculate this, we first determine the external sources of funding in the takeover year by looking at issued equity for cash or net increases in debt, then ascribe the balance to internal financing. In doing so, we consider the consolidated debt of both acquirer and target firms, monitoring any increase in debt of the combined firm compared to the pre-bid values for target and acquirer. Note that in this regard we differ from Martynova and Renneboog (2009) who define debt financing differently.[6][7] Formally, the model used for this research follows the approach established in Dichev and Protroski (1999), defined as:

$$\Delta LTD_t = (LTD_t + CPLTD_t - LTCD_t)_{Consolidated} - [(LTD_{t-1} + CPLTD_{t-1} - LTCD_{t-1})_{Target} + (LTD_{t-1} + CPLTD_{t-1} - LTCD_{t-1})_{Acquirer}]$$

Where:

LTD_t represents the amount of long-term debt due in more than one year (Datastream code WC03251);

$CPLTD_t$ represents the current portion of long-term debt (WC18232);

$LTCD_t$ represents the convertible portion of long-term debt (WC18282).

There are 22 bidders with records of having issued equity for cash, and 112 bidders where there is a positive increment in long-term debt. We determine these new issues of equity by analysing data from Datastream and the Stock Exchange Official Yearbook (SEOYB), augmented by hand-collected annual report and accounts data where Datastream records are missing. Use of the SEOYB is important to avoid

[6] Martynova and Renneboog (2009) use information primarily from LexisNexis but cross-checked against the SDC bond and equity issue databases to determine whether debt financing has been used. We are grateful to Luc Renneboog for this clarification.

[7] Furthermore, as we explain below we classify bids according to their dominant source of finance rather than debt issuance *per se*.

confusing firms that issue equity to markets for cash as opposed to those issuing equity through stock options. We use the annual reports for the latest financial year pre-bid and the financial year post-bid in making this determination. If the fraction of either issued equity for cash or issued debt combined is not more than 50% of the bid value, we consider internal financing as the dominant source of cash for the takeover bid. However, in some cases, both issued equity for cash and the debt increase exceed 100% of the transaction value, with the obvious implication that the firm is raising financing for organic expansion as well as takeover[8]. If neither method of financing exceeds the other by more than a ratio of 100%, this case is classified as "Mixed" financing. If that ratio is exceeded, the higher amount determines the "dominant" financing method. In terms of takeovers using internal financing (IF), we further consider cases where there is an important secondary financing method, since although this secondary financing is less than 50% of the financing source, it could still be an important part of the transaction value. Consequently, we form an internal financing with a significant secondary financing method, or IFS, group which contains three sub-groups: IFS-IEC, IFS-ID and IFS-Mixed. These classifications are, respectively: firms using internal finance where issued equity is between 5% and 50% of transaction value; firms using internal finance where new debt is between 5% and 50% of transaction value; and firms where both new debt and new equity exceed 5%. We do not claim that these classifications are perfect. If it were possible, we would prefer to study the issue of financing sources in a fixed window around a bid. Unfortunately, in the UK very small numbers of firms issued debt in the form of corporate bonds during our study period, hence our use of the Dichev and Protroski (1999) approach. As a robustness check, we carry out a simple four way classification of funding sources where any increase of debt or equity for cash over 5% results in the source being classified as debt, equity or mixed as appropriate. Our results are robust to this alternative classification.

We also need to define our measure of free cash flow (FCF). We measure FCF as in Gregory (2005) and Lang, Stulz and Walkling (1991). FCF is defined as the funds from operating cash flow balance minus: tax paid; dividends paid; interest on short term and long term loans; change in debtors; and change in stocks and WIP. And

[8] Note that we exclude multiple takeovers in the same year

plus: change in creditors; income from investments; and income from quoted investments. The amount is then normalised by capital employed. A firm with high FCF is one that has a pre-bid year average cash holding that is higher than the median of the whole sample. We also use a three-year average FCF figure as a robustness check. Results are qualitatively similar, although somewhat weaker, than those that use the pre-bid cash flow figure.

Alternatively, we could measure surplus cash holdings, rather than free cash flow, although we note that the hypothesis is a free cash *flow* not a free cash *stock* hypothesis. Nonetheless, we acknowledge that a significant body of literature investigating corporate cash holdings has emerged following the seminal work of Harford (1999). In principle, one could estimate the Harford (1999) model but to do so in the context of this sample would require that industry level cash flow information was available for all firms going back to 1981.[9] The problem is that there are many missing dead firms in the *Datastream* data in early years. As we note above, many of our sample firms (particularly the targets) needed the data to be hand collected and Gregory, Thayan and Huang (2009) have to hand-collect a significant proportion of their sample firms. As these missing firms are primarily either failed firms or acquired firms, it is highly likely that any attempt to estimate the Harford (1999) model back as far as 1981 will result in biased estimates. Accordingly, we develop an alternative measure of surplus cash, which is simply the ratio of the cash stock/capital employed in year t-1 divided by the average of this ratio for the previous three years. A cash stock ratio greater than unity implies that the firm is increasing its cash stock. Although this is not our preferred measure we run robustness checks using this variable in place of our free cash flow measure, and footnote where results using this measure differ from those reported.

We now need a measure of the investment opportunity set. For the purpose of testing the FCF hypothesis, Lang, Stulz and Walkling (1991) and Gregory (2005) use the *q* ratio as a measure of the investment opportunity set facing the firm. The assumption is that firms with a *q* ratio>1 have a positive NPV investment opportunity set. There is, however, a major difficulty in applying the *q* ratio to a UK company, in that the

[9] *Inter alia*, the model requires three prior years of cash flow and sales data for every firm in the industry.

replacement cost information of assets is not available in the UK from any source (Gregory 2005, Sudarsanam and Mahate 2006). Furthermore, as we note above, the *q*-ratio measure should be reflective of a firm's marginal *q*, not average *q*. Thus we need a reasonable proxy for this marginal *q*, which can be either a simple book-to-market ratios (BMV) or a comparison of BMV ratios to the industry average. Because of the inadequacy of using of using simple BMV, partly due to high inflation in the earlier years in our sample, and partly because of the Hall (1998) observation that important "knowledge assets" are not recorded in the financial statements, we choose BMV compared to the industry average as a proxy of *q* ratio, so that a high *q* firm is defined as one with a book-to-market ratio that is lower than its industry average. This is the same approach adopted in Gregory (2005). Industry classification follows that in Gregory and Michou (2009). For the whole sample, there are 98 firms with a low *q*, and 54 firms with a high *q*[10]. We then use these definitions of *q* and FCF to partition firms into four categories from high FCF, high *q* to low FCF, low *q*.

We also include a number of control variables based upon findings elsewhere in the literature. These are the pre-tax return on capital employed (ROCE), the pre-bid gearing ratio of the acquirer (equal to the firm's long-term debt divided by its capital employed), a dummy variable for a hostile offer, and variables that control for relative size, the bid premium and the shareholder structure. Relative size is the target company's market capitalisation compared to the bidder's market capitalisation. According to Hansen's (1987) model, the asymmetric information problem will increase as the target's firm size increases, because the risk between the acquirer and target will become larger, and a similar conclusion follows from the risk sharing hypothesis of Martin (1996). Loughran and Vijh (1997) find that the abnormal returns become smaller and eventually become negative if the relative size of the target firm to the acquirer firm increases. However, Asquith, Bruner and Mullins (1983) reach the opposite conclusion. The acquisition premium is the difference between the price paid per share in the transaction and the share price as a percentage of the target share price at four weeks before the announcement of the acquisition. The relevant data is rom the SDC or AMDATA databases, although if this is missing

[10] The preponderance of low *q* firms in this sample of cash acquirers is consistent with the Shleifer and Vishny (2003) hypothesis and the evidence in Bi and Gregory (2009) which finds that cash acquirers are more lowly valued than equity acquirers.

we use the pre-bid share price from Datastream and the bid price. Finally, we control for shareholder structure.

Blockholders and institutional shareholders can perform a monitoring function and reduce agency problems (Jensen, 1991; Cremers and Nair, 2005). As we note above, in a UK setting where shareholders have greater rights over corporate managers than they do in the US, this monitoring function could assist in overcoming any inherent problems from firm managers having "excessive" levels of free cash flow at their disposal. Provided firms are adequately monitored, free cash flow and modest levels of gearing might provide firms with a sensible cushion against distress-inducing events, and, exactly as predicted by the pecking order hypothesis, with a pool of cash with which to undertake positive NPV investments when it may be difficult to obtain funds from other sources. In this study, information on substantial shareholders has to be hand-collected from the SEOYB[11], which lists each firm's substantial shareholders, including individual directors, institutional and non-institutional shareholding. We adopt the approach and cut-off employed from Martin (1996), and split the internal ownership thus: directors with shares of less than 25% but more than 5%; those with more than 25% of the company; institutional shareholdings in excess of 5%; and non-institutional shareholdings in excess of 5%. In UK law, 25% is a particularly important shareholding level, as special resolutions (which include resolutions to increase or decrease capital) require a 75% majority. If our conjectures on monitoring are correct, then we would expect to observe differences between FCF and gearing between high and low institutional ownership firms, and we perform a simple test for this.

Finally, in our regression tests we use the amount of issued debt and equity as alternatives to the simple classification rules described above. These variables are calculated by using the amount of issued equity (for cash) (IEC) and issued debt (ID) both standardised by transaction value (TV).

Overall, the variables can be summarised thus:

[11] No alternative sources are available back to 1984.

Definition of Variables

AHQ = Dummy variable equal to one if the acquiring firm has low BMV (high *q* ratio) relative to its industry BMV

CAR5, 11 = Cumulative abnormal returns for the 5 day interval t-2 to t+2, and the 11 day interval t-5 to t+5 respectively

CFCE = FCF one year prior to the bid year divided by capital employed

CFCELQ = CFCE if the firm's AHQ is equal to zero, zero otherwise

HFCHQ = Dummy variable equal to one if the firm has high CFCE (greater than the sample median) and AHQ equal to one

HFCLQ =Dummy variable equal to one if the firm has high CFCE (greater than the sample median) and AHQ equal to zero

HOSTILE = Dummy variable equal to one if the firm is defined as a hostile bidder in the SDC platinum dataset (cross-checked with *Acquisitions Monthly*)

ID = Dummy variable equal to one if the primary source of bid finance is a debt issue

IDTV = Issued debt used for the bid divided by transaction value

IEC = Dummy variable equal to one if the primary source of bid finance is an equity issue

IECTV = Issued equity for cash used in the bid divided by transaction value

IF = Dummy variable equal to one if the primary source of bid finance is internal

IFS = Dummy variable equal to one if the source of bid financing is primarily internal but with a significant secondary issue of either debt or equity.

INSTH = Amount of institutional shareholding in excess of 5%[12]

LEV =Acquirer's long-term debt divided by capital employed at FYE prior to the bid year

LFCHQ =Dummy variable equal to one if the firm has low CFCE (less than the sample median) and AHQ equal to one

LFCLQ = Dummy variable equal to one if the firm has low CFCE (less than the sample median) and AHQ equal to zero

MBV = Market value at the beginning of bid month / Book value at financial year end (FYE) prior to the bid year

NONINSTH = Amount of non-institutional shareholdings in excess of 5%

[12] See footnote 8.

OFFDIR5 = 0 if directors' holdings (in %) are less than 5%[13], or equal to Directors' holdings (in %) minus 5, if 5% < directors' holdings < 25%

OFFDIR25 = 0 if Directors' holdings (in %) < 25%, or equal to Directors' holdings (in %) minus 25 if directors' holdings >=25%

PREMIUM = bid premium paid for the target, measured as the bid price minus the price one month pre-bid

RELSIZE = Market capitalisation of the target firm divided by market capitalisation of the acquirer

ROCE = Acquirer's pre-tax profit before the bid divided by capital employed

In calculating short run returns, we use a simple market adjusted returns model using the FT All Share Index (FTASI) as our market proxy, to calculate cumulative abnormal returns over the intervals day t-20 to day t+20, day t-5 to day t+5, and day t-2 to day t+2. Draper and Paudyal (2008) also employ a market adjusted returns model. We favour a simple market adjusted returns measure as it avoids any thin trading problems inherent in using daily returns to calculate market-model parameters. The significance of abnormal returns can be estimated as in Brown and Warner (1985), but as a robustness check we also calculate the bootstrapped skewness-adjusted t-statistic, more normally associated with the testing of long run abnormal returns, from Lyon et al (1999). However, whilst expanding the window from 5 days around announcement to 11 days seems to capture a significant increase in market reaction, expanding the window to 41 days around announcement merely adds noise. As such, we drop the 41 day CARs and concentrate our regression tests on the 11-day window. A summary of these variables, together with their means and standard deviations, is given in Table 1.

It is well-documented that longer term returns to acquisitions are as a whole are significantly less than zero, although the evidence on returns to cash acquisitions is mixed (see, for example, Agrawal and Jaffe, 2000). In the UK, Gregory (1997) shows that long run abnormal returns to cash acquirers are negative, but not significantly so. More recently, Conn et al (2005) show that domestic cash acquirer performance over

[13] Note: For the earlier years in our sample, companies were only required to notify the Stock Exchange of holdings in excess of 5% of total shareholdings, so that holdings of less than 5% are simply unobservable. This threshold was later reduced to 3%, but for consistency we retain the 5% limit.

the period 1984-1998 is virtually zero. A question investigated in this paper is whether that long run performance might vary according to the source of cash, and whether it varies with FCF. A consensus seems to be emerging that whilst buy and hold abnormal returns (BHARs) are useful for depicting the experience of investors, statistical inference from BHARs is highly problematic.[14] The properties of calendar time abnormal returns (CTARs) avoids the problem of cross sectional dependence in the abnormal returns (Mitchell and Stafford, 2000), although as Loughran and Ritter (2000) point out, CTAR tests will be weak if managers exercise "behavioural timing" in corporate financing decisions. Given this emerging consensus, we base our analysis of long run abnormal returns on CTARs. The question then arises of how best to estimate these CTARs. Whenever we calculate abnormal returns in calendar time, we have the choice between measuring returns relative to a risk-controlled benchmark, or using a regression-based framework, such as the Fama-French model. Lyon et al. (1999, p.197) suggest that simple CTAR methods appear to be better specified (and more conservative) than the Fama-French three factor approach. Mitchell and Stafford (2000, p.321) also favour the control-portfolio CTAR methodology rather than the Fama-French regression-based approach, noting that because it suffers from fewer statistical flaws "more faith should be placed in these results". However, against this Ang and Zhang (2004) provide evidence in favour of the Fama-French model, but specifically advise against using the Carhart four factor model in tests. Their simulation results suggest that in calendar time, the Fama-French method is well-specified, but they also show that more powerful tests result from using weighted least squares (WLS) rather than ordinary least squares (OLS). An added concern for UK researchers is that it is far from clear that the Fama-French model is entirely appropriate in a UK context (Gregory, Harris and Michou, 2001; Al-Horani, Pope and Stark, 2003; Michou, Mouselli and Stark, 2007; Gregory, Tharyan and Huang, 2009). These contradictory findings in the literature lead us to adopt two approaches to the estimation of CTARs: a control firm approach, which follows that used in a recent study of UK IPOs (Gregory, Guermat and Al-Shawawreh, 2010); and a WLS Fama-French model following Ang and Zhang (2004).

[14] See, for example, Brad Barber's recent seminar at the Financial Management Association Conference, Reno, October 2009.

The Gregory et al (2010) model allows for some variation between the characteristics of the benchmark portfolio and the characteristics of the event firm portfolio, and also deals with the problem of heteroscedasticity. To implement this we regress the portfolio of cash acquirers on a size-matched control portfolio. Let $R_{\tau,t}$ be the time series of a portfolio of the returns of acquiring companies that undertake a cash takeover within the previous τ months. We undertake the basic calendar time test by testing for the significance of α in a time series model

$$R_{\tau,t} = \alpha + (R_{\tau,t})^E + \varepsilon_t \qquad (1)$$

where $(R_{\tau,t})^E$ is the required (or benchmark) return and ε_t is a zero mean disturbance term.

The innovation in their paper is to allow for heteroscedasticity in the CTARs by using a GLS approach. For an equally weighted portfolio, the τ -month calendar time portfolio return is:

$$R_{\tau,t} = \frac{1}{n_{\tau,t}} \sum_{i=1}^{n_{\tau,t}} R_{it}^{(\tau)} \qquad (2)$$

where $n_{\tau,t}$ is the number of firms in the portfolio and $R_{it}^{(\tau)}$ is the return of a firm i that was a cash acquirer within the last τ months. The assumption is that the variance of this calendar time portfolio can be approximated by some function of $\hat{\delta}_0 + \hat{\delta}_1 n_t$, and to ensure that the variance is positive they assume $\hat{Var}_t(u_t) = \exp(\hat{\delta}_0 + \hat{\delta}_1 n_t)$. They then operationalise the model by taking the unrestricted residuals $\hat{u}_t$ from

$$R_{\tau,t} = \alpha + \beta R_{bt} + u_t$$

And then by estimating the regression

$$\log(\hat{u}_t^2) = \delta_0 + \delta_1 \log(n_t) + error_t$$

Finally, they estimate $\hat{Var}(u_t) = \exp(\hat{\delta}_0 + \hat{\delta}_1 \log(n_t))$. As Gregory et al (2010) show, this GLS formulation offers a better fit in terms of adjusted R-squared statistics than the alternative White (1980) heteroscedasticity-corrected standard errors. We find a

similar result in this paper, although inferences from the White (1980) approach are broadly similar. Note that conceptually, this model can be applied perfectly well to the Fama-French model, and indeed we do so. Nonetheless, given the evidence in Ang and Zhang (2004) relates solely to WLS, we only report these WLS results in the paper. However, results are slightly stronger from the GLS method. Inferences are generally the same, with the exception of one of our portfolios which we identify below.

Specifically, the Fama-French three factor model regression which we estimate is:

$$R_{\tau,t} - R_{ft} = a + b\left(R_{mt} - R_{ft}\right) + s.SMB_t + h.HML_t + \varepsilon_t \qquad (3)$$

The Fama-French factors are described in Gregory, Tharyan and Huang (2009) and downloaded from their website. The factors are constructed so as to mimic, as closely as possible, the US factors available on Ken French's data pages.

Finally on the subject of long term returns, whilst CTARs have the inference advantages referred to above, one disadvantage is that they do not lend themselves to the regression-based tests we use for CARs. So instead, we partition our sample according to form of financing, and by FCF and *q*.

Results

Our first results are those based upon CARs partitioned by form of financing, FCF and *q* and FCF, in Table 2. Overall, the 5-day CARs are an insignificant -0.2%, whilst the 11 day CARs are -0.36%, though still insignificant. The only financing sub-group to record a significant 11-day return is the debt issuing group.[15] Here, the CAR is -1.78%, significant at the 5% level using both a Brown-Warner t-test or the bootstrapped skewness-adjusted t-test. For both windows, the internal financing group show the best returns, although these returns are not significant at conventional levels. As a further check that these results are not being driven by outliers, we also report medians and test the significance of the medians using a Wilcoxon Sign-Rank test. Medians are close to the means, and again the 11-day CAR for the ID group is

[15] Note that throughout the partitioned tests, we do not report CARs or CTARs for the mixed and equity-issuing categories as the number of firms is too small to allow meaningful inferences to be drawn. We do, however, include dummy variables for these categories in the regression tests.

significantly negative at the 5% level. Although modest, these preliminary results provide more support for the pecking-order hypothesis than the FCF hypothesis. Partitioning by FCF shows that both short window and longer window CARs are positive for high FCF firms, and negative for low FCF firms, though none of the figures are significant except in the case of the -1.3% median for the low FCF group. However, when we partition on the basis of both *q* and FCF, we see that the worst returns are for low FCF, high *q* firms, which record a return of -2.3% over 5 days, and -4.2% over 11 days. The former is significant at the 10% level using a the BW t-test, whereas the latter is significant at the 5% level using both BW and bootstrapped skewness-adjusted t-tests. Although medians are closer to zero than the means, they are significantly negative for this group at the 5% level for both 5 day and 11 day windows.

Table 3 then partitions the 11-day CARs by both FCF difference and cash-source category (Panel A) and by FCF and *q* (Panel B). Differences are tested using a two-tailed t-test assuming unequal variances, and by a non-parametric Wilcoxon Rank-Sum (or Mann-Whitney) test. Overall, the high FCF firms have CARs that are 2.4% higher than their low FCF counterparts, the difference being significant at the 5% level for both the t-test and non-parametric tests. When we partition by the source of funds we find that the largest, and significant, difference in CARs is in the internal financing category. Here, the high FCF firms have returns that are 4.5% higher than low FCF firms, and again this result is also significant at the 5% level using a non-parametric test. In every source of financing sub-sample, high FCF firms have better returns than low FCF firms, although the differences are not significant in the case of the IFS and ID firms. Panel B shows the results when firms are partitioned by *q* and FCF. Recall that the FCF hypothesis predicts that high FCF, low *q* firms are the problem case. As we have already seen from Table 2, the bad news for the FCF hypothesis is that this category of firms turns out to have the best overall performance. However, the 1.4% difference in CARs between high and low FCF firms in the low *q* category fails to be significant. Ironically, it is FCF differences amongst high *q* firms that turn out to be significant, with high FCF firms out-performing low FCF firms by 4.9%. This result is significant at the 5% level using a t-test, and at the 1% level when we employ the non-parametric test. Amongst high FCF firms, *q* differences are insignificant in explaining returns, but in the low FCF

group high *q* firms under-perform low *q* firms by 3.8%, significant at the 10% level under a t-test, but significant at the 5% level using a non-parametric test. All our results so far are robust to using our alternative cash stock ratio measure, where high cash stock firms are defined as those with a cash stock ratio greater than unity.

On the basis of the results so far, there is little support for the FCF hypothesis. Announcement returns are the opposite to those predicted by the hypothesis, with high FCF firms out-performing low FCF firms, and, most tellingly, *low* FCF high *q* firms experiencing significant negative returns. In addition, firms that acquired for cash principally funded by an increase in debt seem to experience worst returns than those choosing internal finance. We now turn to more rigorous tests of the hypothesis that control for our firm-specific variables. In Table 4, we run regressions with the 11 day CAR as the dependent variable, and with all control variables included. All t-statistics are calculated using White (1980) corrected standard errors. The basic models we use to test the FCF hypothesis are as follows. Model 1A includes both the CFCE, the free cash flow proxy, and AHQ, the proxy for high *q* bidders. Model 1B adds the actual financing proportions IECTV and IDTV to the FCF measures and the control variables. Models 2A and 2B repeat the experiment, but using CFCELQ as the free cash flow proxy. Model 3 then reports results (including financing proportions) using HighFCFHQ, HighFCFLQ (the category predicted to experience negative market returns under the FCF hypothesis) and LowFCFHQ dummies, with lowFCFLQ forming the base case (and hence being picked up by the constant).

In Columns 1 and 2 of Table 4 (Model 1A) we see that none of the control variables are significant at conventional levels, that AHQ has a negative but not quite significant (p=0.109) impact on announcement period returns, but that CFCE has a significant positive impact. Pre-bid leverage has a weakly significant negative association with returns. These result holds for Model 1B (columns 3-4) and further suggests that the proportion of issued debt has a negative impact on performance, the effect is not significant. For Model 2A, we have the result that CFCELQ just fails to have a significant positive impact (Cols 5-6), but once we include the financing proportion variables the coefficient is significantly positive (p=0.056). Once again, pre-bid leverage has a negative association with returns (p=0.037 and 0.042 for models 2A and 2B respectively) and the proportion of debt issued is a highly

significant predictor of negative announcement period returns. Finally, Models 3A and 3B in the final four columns of Table 4 show that significant negative returns of -3.5% or -3.4% (Models 3A and 3B respectively) come from the lowFCF, high q sub-group. The FCF-hypothesised "problem" group, highFCF, low q, have positive, but insignificant, returns equivalent to 1.1% and 1.3% respectively. However, in the case of Models 3A and 3B pre-bid leverage loses its significant explanatory power. These results are similar when the cash stock ratio is employed as our measure of FCF, except that the equivalent of the CFLQ measure simply fails to be significant at conventional levels.

There is no hint in any of our results that high free cash flow is negatively associated with bidder performance, nor that using high levels of debt to finance a bid is perceived as beneficial by the market. Rather, it seems as though having *low* levels of free cash flow is regarded as a negative signal by markets, and that this is particularly true in the case of high *q* firms. To the extent that it is significant, the use of extensive debt financing appears to have a negative association with announcement period returns, and high levels of pre-bid leverage are also, to some extent, associated with negative performance in cash bids. Furthermore, once FCF is controlled for it appears that firms which use internal financing do better than firms that use other sources of funding for their cash bids. Taken as a whole, these announcement period results contradict the FCF hypothesis, and are more consistent with markets viewing acquirers that have high FCF levels as having lower financial distress risk. As a final robustness check, we re-ran the regressions including market timing variables known either to predict the market risk premium or future returns (Harris and Sanchez-Valle, 2000), or to influence the choice of financing method. These variables were: the prior 12 months return on the market; the dividend yield on the market; the Treasury Bill rate; and the difference between the long gilt rate and the Treasury Bill rate. As none of these variables turned out to be significant in predicting the CARs, nor did they change our inferences, we do not report those regressions here.[16]

As we note above, in general UK company law and the *City Code* places greater emphasis on shareholder rights relative to manager rights than does US law. We

[16] The authors are grateful to Paul Draper for suggesting this robustness check.

further argued that strong institutional shareholding in the UK was likely to reinforce that position. One obvious test is to examine whether high FCF is less of a problem in high institutional ownership firms than low institutional ownership firms. We split our sample using the 25% threshold explained above, and run separate parsimonious regressions on our CFCELQ variable for high and low ownership firms.[17] As a further robustness check, we change the institutional ownership threshold to 10%. The results are reported in Table 5. The first two columns show the results from the high institutional ownership group (n = 46), and confirm that in this sub-group, high FCF firms have positive returns, but high gearing firms have negative returns. IDTV is negative, and highly significant and intriguingly IECTV is significantly positive. Last, within this group returns seem to be positively related to institutional ownership and modest levels of directors' ownership. However, in the low institutional ownership sub-group in columns 5 and 6 (n=106), explanatory power is far lower, and although CFCELQ and LEV retain the same signs, neither is significant. We re-run the regressions using a more modest cut-off for institutional ownership of 10%. The results are reported in Columns 3-4 of Table 5 for the high ownership group, and the final columns of Table 5 for the low ownership group. The central results on CFCELQ and IEDTV are unaltered, as is IECTV, but note that LEV now becomes significantly negative. For the low ownership group, only IECTV is a significant negative predictor of abnormal returns. It seems that even modest levels of institutional ownership are enough to ensure high FCF and low gearing are positive indicators of the likely success of the acquisition. We see this as consistent with our argument that good monitoring, coupled with high levels of shareholder rights, is able to overcome any agency conflicts affecting the financing of any cash acquisition. However, these effects are not robust to the use of a cash stock ratio, as when we substitute our cash stock ratio measure for CFCELQ the variable is simply insignificant.

Of course, given the findings from the long-term acquirer performance literature, it may be that at announcement markets under-react to news about the takeover. It could be the case that markets simply fail to anticipate the full importance of free cash flow at the time of the takeover. Furthermore, it can be argued that by looking at the

[17] We run separate regressions as factors affecting performance in both groups turn out to be very different.

change in consolidated debt and acquirer equity over the year of takeover, our methods of determining bid financing necessarily involve some look ahead bias. A comprehensive test of the hypothesis therefore requires us to examine long run returns. As in the case of many long term studies (Agrawal, Jaffe and Mandelker, 1992; Loughran and Vijh, 1997; Rau and Vermaelen, 1998), we choose to look at returns for the 60-month period following the acquisition. Note, however, that Ang and Zhang (2004) show that whilst long-horizon CTAR returns from the three-factor model are well specified, they have low power to detect abnormal returns at long horizons. Table XI in Lyon et al (1999) also suggests that tests using control portfolios are generally well specified, but tend to be more conservative than inferences from the Fama-French regressions at the 60 month horizon, particularly with regard to the detection of negative abnormal performance.[18] Ang and Zhang (2004, p.266-7) also note that the FF regressions have lower power to detect negative induced returns, particularly at long horizons.

Turning to the results themselves, Table 6 presents the results for the GLS model of Gregory et al (2010). Overall, and in line with previous findings on UK cash takeovers, alphas are slightly negative but not significantly different from zero. Looking at the different financing groups, we see that although the debt issuers have the worst performance, at -0.26% per month, the effect is not significant. However, when we turn to the results partitioned on FCF, we see that low FCF firms register a significant (at the 10% level) negative abnormal return of -0.31% per month. One difficulty with partitioning too finely on a small sample is that the sub-grouping tend to be too small to exhibit significance. This is a particular problem when partitioning on both *q* and FCF, and we deal with this by simply partitioning into the hypothised "problem" group of High FCF, Low q firms and compare them to remaining firms. When we do so, it turns out that the high FCF, low *q* sub-group of acquirers that are hypothesised to have the worst performance under the FCF hypothesis actually exhibit insignificant positive performance, whereas the remainder exhibit significant negative performance of -0.32% per month.

[18] Specifically, the rejection rate in random samples is 1.3% compared to a theoretical level of 2.5%.

Given our announcement period results, we also partition on the basis of institutional ownership. In the final two columns of Table 6 we report the high (>=25%) institutional and low (< 25%) institutional ownership sub-samples. The former have an insignificant positive return, but the latter exhibit a significant (at the 10% level) negative return of -0.36% per month.

In Table 7, we present the results from the Ang and Zhang (2004) preferred Fama-French WLS regressions. These produce similar, but somewhat stronger, results than those from Table 6. Again, debt issuers are the worst performing sub-group with a negative return of -0.28% per month, although the significance level is only 15.2%. The high FCF group exhibit a performance that is very close to zero. By contrast, the low FCF group have significant returns of -0.37% per month. In addition, we see that the low FCF group carry higher risk factor loadings on each of the three Fama-French factors than the high FCF group. This is consistent with low FCF acquirers having a greater degree of distress risk. Once again, the high FCF, low q group have insignificant positive returns but the remainder (non High FCF, low q firms) have returns that are a highly significant -0.36% per month. This group also carries the highest exposure to market risk and the HML factor. Finally, the results for the institutional ownership partition confirm those in Table 6. It is the low ownership sub-group that have the worst (and significant) negative performance, and they also have a higher exposure to market and HML risk (though a lower small company risk).

Conclusions

In this paper, we have argued that a clean test of the FCF hypothesis can be conducted by focussing on pure cash takeovers. Indeed, Jensen himself sets up the motivation for this study when (1988, p. 34) he makes a the following claim: 'free cash flow theory implies that managers of firms with unused borrowing power and large free cash flows are more likely to undertake low-benefit or even value destroying mergers'. We argue that looking at pure cash takeovers goes to the heart of this claim. Following Gompers et al (2003), and Cremers and Nair (2005), we hypothesised that the combination of strong shareholder rights and significant monitoring from institutional shareholders may significantly reduce any agency problems caused by high FCF. As the UK is characterised by an environment that has low protection against takeovers, and high levels of institutional shareholding, it offers an excellent

testing ground for this hypothesis. When we test the FCF hypothesis in the UK environment, our results provide no evidence to support the FCF hypothesis. Both announcement period and long terms returns show that acquirers with low free cash flow, *not* high free cash flow, are associated with acquisitions that damage shareholder wealth. Indeed, the sub-grouping of firms with high FCF and low *q* ratios is the only grouping to exhibit positive (although not significant) long-run returns. Analysis of announcement period returns further suggest that high levels of pre-bid leverage may also have a negative impact on shareholder wealth. In addition, we provide evidence from announcement period returns that relying on internal finance to finance cash acquisitions may be beneficial, whilst a reliance on debt financing may be detrimental. However, whilst these effects carry through to the longer term, they are not statistically significant at long horizons. Finally, we show that the benefits of having a high FCF seem to be greatest in firms financing acquisitions from internal finance.

A question that we explore is why the UK evidence is so different from that of the US. Of course, using the standard La Porta et al (1998) scoring of governance, the US and the UK do not look that different. However, consistent with Cremers and Nair (2005), we argue that it is the stronger position of shareholders relative to firm managers that is important in the UK (Bush, 2005; Sudarsanam, 2000), and that furthermore the high level of institutional ownership coupled with a high concentration of fund managers (Stapledon and Bates, 2002) plays an important role in monitoring. Consistent with that, we show that the positive effects of high FCF and the negative effects of high leverage are concentrated in high institutional ownership firms, although the former effect is not observed when we run our regressions using a cash holding, rather than a cash flow, proxy for FCF. One explanation is that strong shareholder rights and good monitoring are capable of overcoming any inherent agency problems associated with high levels of FCF. However, we acknowledge that an alternative explanation is simply that the more liberal market for takeovers in the UK serves to discipline managers, an effect that would be predicted by the FCF hypothesis.

In addition, our findings may be viewed as providing some support for the Myers and Majluf (1984) pecking-order theory. Our results also provide support for a theory

where low FCF and high leverage predict financial distress. Our regression tests show that this result is not simply an artefact of firm profitability, in that high FCF is positively associated with bidder returns even after ROCE is controlled for. Unfashionable as it may have been (at least until recently), we show that far from being undesirable, having higher levels of free cash flow and lower levels of debt can be associated with the superior performance of cash acquirers, provided strong shareholder rights and institutional shareholder monitoring is present.

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Table 1: Summary Statistics

Variable	Obs	Mean	Std.
CAR5	152	-0.00205	0.050392
CAR11	152	-0.00362	0.065058
MBV	152	1.641652	2.433907
HOSTILE	152	0.131579	0.33915
OFFDIR5	152	0.655526	2.615442
OFFDIR25	152	0.831974	4.934256
INSTH	152	18.42863	24.22669
NONINSTH	152	1.768355	8.041062
RELSIZE	152	0.537103	1.070665
PREMIUM	152	0.380404	0.310038
IF	152	0.282895	0.451895
IFS	152	0.243421	0.430566
IEC	152	0.059211	0.236799
ID	152	0.375	0.485723
IECTV	152	0.222127	0.814503
IDTV	152	1.940097	8.353692
LEV	152	0.23398	0.228231
ROCE	152	0.185049	0.182254
AHQ	152	0.355263	0.480175
CFCE	152	0.0885	0.139193
HIGHFCFHQ	152	0.210526	0.40903
HIGHFCFLQ	152	0.289474	0.455017
LOWFCFHQ	152	0.144737	0.352998
LOWFCFLQ	152	0.355263	0.480175
CFCELQ	152	0.050374	0.108158

The variables are defined as follows: CAR5, 11 = Cumulative abnormal returns for the 5 day interval t-2 to t+2, and the 11 day interval t-5 to t+5 respectively; MBV = Market value at the beginning of bid month / Book value at financial year end (FYE) prior to the bid year; HOSTILE = Dummy variable equal to one if the firm is defined as a hostile bidder in the SDC platinum dataset; OFFDIR5 = 0 if directors' holdings (in %) are less than 5%, equal to Directors' holdings (in %) minus 5, if 5% < directors' holdings < 25%; OFFDIR25 = 0 if Directors' holdings (in %) < 25%, equal to Directors' holdings (in %) minus 25 if directors' holdings >=25%; INSTH = Amount of institutional shareholding in excess of 5%; NONINSTH = Amount of non-institutional shareholdings in excess of 5%; RELSIZE = Market capitalisation of the target firm divided by market capitalisation of the acquirer; PREMIUM = bid premium paid for the target, measured as the bid price minus the price one month pre-bid; IF = Dummy variable equal to one if the primary source of bid finance is internal; IFS = Dummy variable equal to one if the source of bid financing is primarily internal but with a significant secondary issue of either debt or equity; IEC = Dummy variable equal to one if the primary source of bid finance is an equity issue; ID = Dummy variable equal to one if the primary source of bid finance is a debt issue; IECTV = Issued equity for cash used in the bid divided by transaction value; IDTV = Issued debt used for the bid divided by transaction value; LEV =Acquirer's long-term debt divided by capital employed at FYE prior to the bid year; ROCE = Acquirer's pre-tax

profit before the bid divided by capital employed; AHQ = Dummy variable equal to one if the firm has low BMV (high *q* ratio) relative to its industry BMV; CFCE = FCF one year prior to the bid year divided by capital employed; HighFCHQ = Dummy variable equal to one if the firm has high CFCE and AHQ equal to one; HighFCLQ =Dummy variable equal to one if the firm has high CFCE and AHQ equal to zero; LowFCHQ =Dummy variable equal to one if the firm has low CFCE and AHQ equal to one; LowFCLQ = Dummy variable equal to one if the firm has low CFCE and AHQ equal to zero; CFCELQ = CFCE if the firm's AHQ equal to zero, zero otherwise

Table 2: Significance tests of 5-day (t-2 to t+2) and 11-day (t-5 to t+5) CARs.

	Full	IF	IFS	ID	High FCF	Low FCF	highFCFHQ	highFCFLQ	lowFCFHQ	lowFCFLQ
CAR 5 Mean	-0.00205	0.00773	-0.0001	-0.00344	0.00223	-0.00632	-0.00001	0.00385	-0.02290	0.00043
Significance									*	
Median	-0.00533	-0.00486	-0.01075	-0.00529	-0.00525	-0.00657	-0.00526	-0.00507	-.019276	-0.00323
Significance									**	
CAR 11 Mean	-0.00362	0.01146	0.00518	-0.01780	0.00832	-0.01556	0.00703	0.00927	-0.04225	-0.00469
Significance				**,++					**,+	
Median	-0.00222	0.01582	0.00571	-0.01684	0.00841	-0.01321	0.01637	0.00694	-0.02582	-0.00765
Significance				**		**			**	
Number of observations	152	43	37	57	76	76	32	44	22	54

Definitions are: IF = Dummy variable equal to one if the primary source of bid finance is internal; IFS = Dummy variable equal to one if the source of bid financing is primarily internal but with a significant secondary issue of either debt or equity; ID = Dummy variable equal to one if the primary source of bid finance is a debt issue; CFCE = FCF one year prior to the bid year divided by capital employed; High FCF=dummy variable equal to one if a firm is above the median FCF; Low FCF=dummy variable equal to one if a firm is below the median FCF; HighFCHQ = Dummy variable equal to one if the firm has high CFCE and AHQ equal to one; HighFCLQ =Dummy variable equal to one if the firm has high CFCE and AHQ equal to zero; LowFCHQ =Dummy variable equal to one if the firm has low CFCE and AHQ equal to one; LowFCLQ = Dummy variable equal to one if the firm has low CFCE and AHQ equal to zero. Significance levels are shown at 5% (**, ++) and 10% (*, +) levels from BW t-tests and boostrapped skewness-adjusted t-tests respectively, and for the Wilcoxon Sign-Rank test in the case of medians.

Table 3: Difference Tests on CARS, t-5 to t+5

Panel A FCF differences by category

CAR 11	Full	IF	IFS	ID
High FCF-LowFCF	0.023889	0.045044	0.0141	0.013072
T-test for differences	**	**		
Wilcoxon / Mann-Whitney test	**	**		

The table shows the CARs by category of financing, where IF = Dummy variable equal to one if the primary source of bid finance is internal; IFS = Dummy variable equal to one if the source of bid financing is primarily internal but with a significant secondary issue of either debt or equity; IEC = Dummy variable equal to one if the primary source of bid finance is an equity issue; ID = Dummy variable equal to one if the primary source of bid finance is a debt issue. Significance levels are shown at 5% (**) and 10% (*) levels from two-tailed t-tests assuming unequal variances, and from a Wilcoxon Rank-Sum (Mann-Whitney) test.

Panel B FCF differences partitioned on Q

Group	High FCF	Low FCF	Diff, HFCF-LowFCF	T-test for differences	Wilcoxon / Mann-Whitney test
High Q	0.007031	-0.04225	0.049281	**	***
Low Q	0.009265	-0.00469	-0.01396		
Diff, HQ=LQ	0.002234	0.03756			
T-test for differences		*			
Wilcoxon / Mann-Whitney test		**			

Significance levels are shown at 5% (**) and 10% (*) levels from two-tailed t-tests assuming unequal variances.

Table 4 Regression tests with 11-day (t-5 to t+5) CARs as the dependent variable

Independent Variables	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
cfce	0.092	0.011	0.097	0.004								
	(0.036)		(0.034)									
ahq	-0.017	0.109	-0.017	0.106								
	(0.010)		(0.010)									
cfcelq					0.075	0.106	0.085	0.056				
					(0.046)		(0.044)					
highfcfhq									0.007	0.592	0.007	0.604
									(0.013)		(0.013)	
highfcflq									0.011	0.438	0.013	0.353
									(0.014)		(0.013)	
lowfcfhq									-0.035	0.046	-0.034	0.062
									(0.018)		(0.018)	
iectv			-0.008	0.229			-0.007	0.297			-0.008	0.242
			(0.006)				(0.007)				(0.006)	
idtv			-0.001	0.006			-0.001	0.001			-0.001	0.075
			(0.000)				(0.000)				(0.000)	
hostile	0.000	0.981	-0.002	0.899	0.000	0.980	-0.001	0.933	0.001	0.936	0.000	0.997
	(0.016)		(0.016)		(0.016)		(0.016)		(0.016)		(0.016)	
offdir5	0.001	0.199	0.002	0.163	0.001	0.213	0.002	0.176	0.002	0.196	0.002	0.169
	(0.001)		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)	
offdir25	0.000	0.426	0.000	0.241	0.000	0.878	0.000	0.653	0.000	0.635	0.000	0.484
	(0.000)		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)	
insth	0.000	0.557	0.000	0.547	0.000	0.385	0.000	0.370	0.000	0.459	0.000	0.464
	(0.000)		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)	
noninsth	-0.001	0.123	-0.001	0.104	-0.001	0.093	-0.001	0.072	-0.001	0.151	-0.001	0.130
	(0.001)		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)	
relsize	-0.003	0.547	-0.003	0.550	-0.004	0.522	-0.004	0.522	-0.003	0.550	-0.003	0.563

	(0.006)		(0.006)		(0.006)		(0.006)		(0.006)		(0.006)	
premium	-0.017	0.350	-0.021	0.225	-0.016	0.374	-0.021	0.247	-0.018	0.295	-0.023	0.200
	(0.018)		(0.018)		(0.018)		(0.018)		(0.017)		(0.018)	
roce	0.018	0.530	0.022	0.445	0.021	0.428	0.026	0.349	0.031	0.296	0.036	0.238
	(0.029)		(0.029)		(0.027)		(0.028)		(0.029)		(0.030)	
lev	-0.037	0.077	-0.036	0.089	-0.045	0.037	-0.044	0.042	-0.034	0.117	-0.032	0.134
	(0.021)		(0.021)		(0.021)		(0.021)		(0.021)		(0.021)	
_cons	0.007	0.572	0.011	0.379	0.005	0.645	0.009	0.441	0.006	0.665	0.009	0.540
	(0.012)		(0.012)		(0.011)		(0.012)		(0.014)		(0.014)	
R-squared	0.123		0.143		0.093		0.113		0.127		0.142	
F-test probability	0.011		0.001		0.062		0.009		0.013		0.003	
Number of observations	152		152		152		152		152		152	

Figures in parentheses are the standard errors of the coefficients. Variables are: CFCE = FCF one year prior to the bid year divided by capital employed; AHQ = Dummy variable equal to one if the firm has low BMV (high *q* ratio) relative to its industry BMV; High FCF=dummy variable equal to one if a firm is above the median FCF; Low FCF=dummy variable equal to one if a firm is below the median FCF; HighFCHQ = Dummy variable equal to one if the firm has high CFCE and AHQ equal to one; HighFCLQ =Dummy variable equal to one if the firm has high CFCE and AHQ equal to zero; LowFCHQ =Dummy variable equal to one if the firm has low CFCE and AHQ equal to one; LowFCLQ = Dummy variable equal to one if the firm has low CFCE and AHQ equal to zero; CFCELQ = CFCE if the firm's AHQ equal to zero, zero otherwise; MBV = Market value at the beginning of bid month / Book value at financial year end (FYE) prior to the bid year; HOSTILE = Dummy variable equal to one if the firm is defined as a hostile bidder in the SDC platinum dataset; OFFDIR5 = 0 if directors' holdings (in %) are less than 5%, equal to Directors' holdings (in %) minus 5, if 5% < directors' holdings < 25%; OFFDIR25 = 0 if Directors' holdings (in %) < 25%, equal to Directors' holdings (in %) minus 25 if directors' holdings >=25%; INSTH = Amount of institutional shareholding in excess of 5%; NONINSTH = Amount of non-institutional shareholdings in excess of 5%; RELSIZE = Market capitalisation of the target firm divided by market capitalisation of the acquirer; PREMIUM = bid premium paid for the target, measured as the bid price minus the price one month pre-bid; IECTV = Issued equity for cash used in the bid divided by transaction value; IDTV = Issued debt used for the bid divided by transaction value; LEV =Acquirer's long-term debt divided by capital employed at FYE prior to the bid year; ROCE = Acquirer's pre-tax profit before the bid divided by capital employed.

Table 5 Regression Tests with 11-day (t-5 to t+5) CARs as the dependent variable for sample split between high and low institutional ownership

Inst. Ownership	High, >=25%		High, >=10%		Low, <25%		Low, <10%	
Independent Variables	**Coef.**	**p**	**Coef.**	**p**	**Coef.**	**p**	**Coef.**	**p**
cfcelq	0.128	0.031	0.109	0.064	0.105	0.204	0.054	0.563
	(0.057)		(0.057)		(0.082)		(0.094)	
iectv	0.022	0.030	0.015	0.018	-0.011	0.206	-0.017	0.031
	(0.010)		(0.006)		(0.009)		(0.008)	
idtv	-0.001	0.001	-0.001	0.008	0.000	0.555	0.003	0.381
	(0.000)		(0.000)		(0.001)		(0.003)	
hostile	0.000	0.995	0.002	0.942	-0.004	0.871	0.001	0.968
	(0.025)		(0.023)		(0.026)		(0.029)	
offdir5	0.004	0.029	0.003	0.045	0.001	0.552	-0.001	0.767
	(0.002)		(0.001)		(0.002)		(0.002)	
offdir25	0.001	0.779	0.001	0.769	0.000	0.464	0.000	0.457
	(0.002)		(0.002)		(0.001)		(0.001)	
insth	0.001	0.025	0.000	0.192	0.000	0.881	0.001	0.778
	(0.001)		(0.000)		(0.001)		(0.002)	
noninsth	0.000	0.621	0.000	0.801	-0.001	0.339	-0.001	0.104
	(0.001)		(0.001)		(0.001)		(0.001)	
relsize	0.000	0.989	0.000	0.986	-0.011	0.217	-0.012	0.103
	(0.008)		(0.008)		(0.009)		(0.007)	
premium	0.002	0.953	-0.024	0.458	-0.030	0.182	-0.027	0.248
	(0.028)		(0.032)		(0.022)		(0.024)	
roce	-0.020	0.661	0.011	0.779	0.043	0.354	0.036	0.486
	(0.044)		(0.039)		(0.046)		(0.052)	
lev	-0.081	0.230	-0.057	0.035	-0.026	0.263	0.002	0.963
	(0.066)		(0.027)		(0.024)		(0.043)	
_cons	-0.061	0.118	-0.011	0.707	0.012	0.512	0.007	0.742
	(0.038)		(0.028)		(0.017)		(0.021)	
R-squared	0.319		0.196		0.138		0.201	
F-test probability	0.004		0.001		0.003		0.000	
Number of observations	46		70		106		82	

Figures in parentheses are the standard errors of the coefficients. Variables are: CFCELQ = CFCE if the firm's AHQ equal to zero, zero otherwise; MBV = Market value at the beginning of bid month / Book value at financial year end (FYE) prior to the bid year; HOSTILE = Dummy variable equal to one if the firm is defined as a hostile bidder in the SDC platinum dataset; OFFDIR5 = 0 if directors' holdings (in %) are less than 5%, equal to Directors' holdings (in %) minus 5, if 5% < directors' holdings < 25%; OFFDIR25 = 0 if Directors' holdings (in %) < 25%, equal to Directors' holdings (in %) minus 25 if directors' holdings >=25%; INSTH = Amount of institutional shareholding in excess of 5%; NONINSTH = Amount of non-institutional shareholdings in excess of 5%; RELSIZE = Market capitalisation of the target firm divided by market capitalisation of the acquirer; PREMIUM = bid

premium paid for the target, measured as the bid price minus the price one month pre-bid; IECTV = Issued equity for cash used in the bid divided by transaction value; IDTV = Issued debt used for the bid divided by transaction value; LEV =Acquirer's long-term debt divided by capital employed at FYE prior to the bid year; ROCE = Acquirer's pre-tax profit before the bid divided by capital employed.

Table 6: GLS regressions of 60-month Calendar Time Returns on Size-matched Benchmark Returns

	Full	IF	IFS	ID	High FCF	Low FCF	HFCFLQ	Non-HFCFLQ	High Inst. Ownership	Low Inst. Ownership
N	279	265	265	279	*266*	279	263	279	276	265
Alpha	**-0.002**	**-0.0014**	**-0.0007**	**-0.0026**	**-0.0013**	**-0.0031***	**0.0011**	**-0.0032****	**0.0024**	**-0.0036***
P-value from ***t***-test	*0.177*	*0.55*	*0.769*	*0.181*	*0.473*	*0.096*	*0.666*	*0.041*	*0.284*	*0.069*
Beta	**1.0967*****	**0.9955*****	**1.0126*****	**1.1136*****	**1.0704*****	**1.1166*****	**1.0573*****	**1.1044*****	**.9989*****	**1.0721*****
P-value from ***t***-test	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
R-square	**0.8226**	**0.6006**	**0.5647**	**0.7407**	**0.72**	**0.7607**	**0.6015**	**0.8268**	**0.6269**	**0.7117**

The table shows the results of the results of regressing CT portfolio returns on their size-adjusted benchmarks by category of financing, using the procedure detailed in the text, where IF = Dummy variable equal to one if the primary source of bid finance is internal; IFS = Dummy variable equal to one if the source of bid financing is primarily internal but with a significant secondary issue of either debt or equity; IEC = Dummy variable equal to one if the primary source of bid finance is an equity issue; ID = Dummy variable equal to one if the primary source of bid finance is a debt issue; High FCF=dummy variable equal to one if a firm is above the median FCF; Low FCF=dummy variable equal to one if a firm is below the median FCF; HighFCLQ =Dummy variable equal to one if the firm has high CFCE and AHQ equal to zero; High Inst. Ownership refers to that sub-group of firms which has institutional ownership greater than or equal to 25%, with Low Inst. Ownership being the sub-group that does not satisfy this criterion. Significance levels are shown at the 1%(***), 5% (**) and 10% (*) levels.

Table 7: WLS regressions of 60-month Calendar Time Returns

The regression is described in the text and is:

$$R_{\tau,t} - R_{ft} = a + b\left(R_{mt} - R_{ft}\right) + s.SMB_t + h.HML_t + \varepsilon_t$$

	Full	IF	IFS	ID	High FCF	Low FCF	HFCFLQ	Non-HFCFLQ	High Inst. Ownership	Low Inst. Ownership
N	279	265	265	279	*266*	279	263	279	276	265
Intercept	**-0.0019**	**-0.0013**	**-0.0008**	**-0.0028**	**-0.0002**	**-0.0037****	**0.0024**	**-0.0036*****	**0.0021**	**-0.0037*****
P-value from ***t***-test	*0.121*	*0.524*	*0.708*	*0.152*	*0.922*	*0.028*	*0.278*	*0.005*	*0.131*	*0.007*
RM-RF	**1.0524*****	**0.9749*****	**1.1080*****	**1.0550*****	**1.0284*****	**1.0783*****	**1.0232*****	**1.0629*****	**0.8965*****	**1.1071*****
P-value from ***t***-test	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
SMB	**0.6989*****	**0.6283*****	**0.6738*****	**0.7376*****	**0.6599*****	**0.7449*****	**0.7700*****	**0.6722*****	**0. 8225*****	**0.6399*****
P-value from ***t***-test	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
HML	**0.2800*****	**0.3272*****	**0.1878****	**0.2625*****	**0.2145*****	**0.3333*****	**0.2431*****	**0. 2953*****	**0. 2553*****	**0.2992*****
P-value from ***t***-test	*0.000*	*0.000*	*0.015*	*0.000*	*0.000*	*0.000*	*0.001*	*0.000*	*0.000*	*0.000*
R-square	**0.8707**	**0.6587**	**0.7289**	**0.7668**	**0.798**	**0.8274**	**0.6306**	**0.8999**	**0.6813**	**0.8894**

The table shows the results of the results of a WLS regression of CT portfolio excess returns on the Fama-French factors by category of financing, where IF = Dummy variable equal to one if the primary source of bid finance is internal; IFS = Dummy variable equal to one if the source of bid financing is primarily internal but with a significant secondary issue of either debt or equity; IEC = Dummy variable equal to one if the primary source of bid finance is an equity issue; ID = Dummy variable equal to one if the primary source of bid finance is a debt issue; High FCF=dummy variable equal to one if a firm is above the median FCF; Low FCF=dummy variable equal to one if a firm is below the median FCF; HighFCLQ =Dummy variable equal to one if the firm has high CFCE and AHQ equal to zero; High Inst. Ownership refers to that sub-group of firms which has institutional ownership greater than or equal to 25%, with Low Inst. Ownership being the sub-group that does not satisfy this criterion. Significance levels are shown at the 1%(***), 5% (**) and 10% (*) levels.

Appendix: Shareholding patterns (in percent) in the UK and US

UK DATA	PENSION FUNDS	INSURANCE COS	UNIT TRUSTS	IINVESTMENT TRUSTS & OTHER FIN. INST.	BANK PERSONAL TRUSTS	FOREIGN	INDIVIDUALS & CHARITIES	OTHER	TOTAL	DOMESTIC INSTITUTION-AL TOTAL
1990	31.7	20.4	6.1	2.3	N/A	11.8	22.2	5.5	100	60.5
1994	27.8	21.9	6.8	3.3	N/A	16.3	21.6	2.4	100	59.8
1999	19.6	21.6	2.7	7	N/A	29.3	16.6	3.3	100	50.9
US DATA	PENSION FUNDS	INSURANCE COS	Open Ended MUTUAL	Closed Ended MUTUAL	BANK PERS TRUSTS	FOREIGN	HOUESHOLD & NON-PROFIT	OTHER		DOMESTIC INSTITUTION-AL TOTAL
1990	24.4	4.6	6.6	0.5	5.4	6.9	51.0	0.7	100	36.0
1995	23.2	5.3	12.1	0.5	2.7	6.2	49.1	1.0	100	41.1
1999	17.9	6.0	17.4	0.2	1.7	7.9	47.7	1.3	100	41.4

Sources: UK Data are from the Office Of National Statistics, Share Ownership Report as at 31st December 2003. Available on line at www.statistics.gov.uk. US data are derived from the NYSE Factbook On Line at www.nysedata.com/factbook/.