Long run abnormal returns to acquiring firms: the form of payment hypothesis, bidder hostility and timing behavior

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Abstract

In this paper, we set out to investigate the anomaly of previously-recorded poor post-bid performance of acquirers. In particular, we investigate the form of payments hypothesis, the form of bid hypothesis (hostile versus agreed) and the behavioral timing hypothesis, using a UK sample. In the US, the majority of tender offers, often taken as an indicator of bid hostility, are cash financed, making the disaggregation of hypotheses on the effects of form of financing and bidder hostility problematic. Using the UK as a "natural experiment" that allows examination of the effect of the form of payment separately from bidder hostility in a way not easily achievable in the US, we show that the form of payment hypothesis interacts with bid hostility, or "disciplinary bidding", in explaining acquirer wealth effects.

In line with previous research, we find support for the form of payment hypothesis (Aggrawal and Jaffe, 2000), but also show the combination of form of the bid and form of payment is a critical factor in determining post bid returns. Last, we show that both the form of payment chosen and the likelihood of a hostile bid are contingent upon macro-economic variables. This finding in consistent with the Loughran and Ritter (2000) "behavioral timing" hypothesis and has implications for the use of calendar time returns in long-run performance studies. In contrast to the findings of Mitchell and Stafford (2000) we also find evidence that calendar time performance measures are significantly worse during "hot" periods.

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I. Introduction

Despite the evidence on whether shareholders actually benefit from acquisitions in the long run, the level of acquisition and merger activity appeared to accelerate rather than decelerate in the run-up to the new millennium. Theories put forward to explain the disappointing average post-bid performance of bidders include the form of payment and form of bid (hostile versus agreed) hypotheses (Agrawal and Jaffe, 2000) and the behavioral timing hypothesis of Loughran and Ritter (2000). If the behavioral finance hypothesis is true, we should observe that the use of equity financing is likely to be correlated with valuation ratios of the bidder, and that post-bid returns are poorer for "glamour" acquirers than for "value" acquirers. Furthermore, we might expect that bids undertaken in "hot" months when market valuations are high will be associated with poorer post-bid performance. In this study, we investigate these hypotheses using a sample of UK bids. Historically, the UK has been by far the most important European market for corporate control, partly because of the comparative ease with which hostile bids can be made in the UK compared to other EU countries (Mayer, 1996). In addition, there are similarities between the UK and US which make the former market an interesting "out-of-sample" test for some of the research findings to emerge from the US. Most intriguingly, though, there are institutional differences between the UK and the US that allow the form of payment hypothesis to be disentangled from the question of bidder hostility as, in contrast to the US position, many hostile bids are made when the form of payment is in equity. Put in US terminology, "tender offers" can be, and frequently are, financed by equity. US studies typically report that mergers are much more likely to be financed with cash than tender offers. For example, Rau and Vermaelen (1998) report that only 7.5% of tender offers are financed through stock (equity) whilst 50.7% of mergers are stock-financed. By contrast, in our sample covering 18 years of UK takeovers, 64.5% of hostile bids (similar to tender offers) are stock-financed, very close to the 63.2% of non-hostile bids ("mergers") financed in this way. This suggests a "natural experiment" to disaggregate the two effects may be possible in the UK in a way that is not easily achievable in the US, as in the latter market the form of financing is highly correlated with bid

hostility in a way that does not occur in the UK. The UK has no direct equivalent to the tender offer, so partitioning in studies of takeover returns is invariably made on the basis of "hostility". Generally, US studies partition on the basis of tender offers versus mergers. Schwert (2000) is a notable exception, but that study does not set out to examine long run bidder returns. Schwert does not directly present evidence on equity-financed hostile bids as the focus of the research is upon differing definitions of hostility.

There are several reasons why the UK takeover environment may favor equity financing of bids compared to the position in the US. First, the UK market is dominated by institutional investors. The figures in Table 1 show that institutional investors held just under half the market value of UK equities in 1975, rising to 57.6% by 1981 and just under 60% by the end of our sample period. By contrast, despite a trend towards institutional investment in the US during this period through the growth of mutual funds and pension funds, institutional holdings were only 36% by 1990 rising to 41.1% by 1995. An even more telling statistic, given that foreign investors also tend to be dominated by institutions, is the difference between individual (or household) investor shareholdings in the two markets. During our sample period, this investor group only fell below 50% of the US market in 1995. By contrast, in the UK the holdings of this group were only 21.6% in 1994, having fallen from 30.4% in 1981. Perhaps even more crucial in explaining financing differences is the fact that 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%. 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. Given this tacit approval may have been needed in any event, the form of financing in a hostile bid may well be less of an issue. The relative unimportance of individual investors in the UK throughout the sample period means that there is less likely to be an emphasis on cash as a form of payment in acquisitions.

A second major difference between the UK and the US during our sample period is the flexibility in accounting for takeovers and mergers in the UK compared to the US. Importantly, before the introduction of the UK Financial Reporting Standard (FRS) 10, which applied to financial statements in respect of accounting periods ending on or after 23rd December 1998, British acquirers had been able to write off goodwill directly to reserves. Indeed, the UK accounting regime in force between the 1970s and 1994 allowed the difference between the nominal value and fair value of equity issued to finance the bid to be used to write-off goodwill arising on the acquisition itself. This historical ability to write-off goodwill has been shown to be a significantly positively associated with the probability of a bid being financed by equity in the UK (Gregory, 2000). In addition, until FRS 7 came into being in respect of accounting periods beginning on or after 23rd December 1994, the previous standard (Statement of Standard Accounting Practice, SSAP 22) allowed the acquiring firm to provide for post-acquisition re-organisation costs. These could also be written off to reserves created at the time of the merger. This has been used in a very "creative" fashion to manipulate post-bid earnings (Smith, 1992).[1] These arrangements stood in marked contrast to the US and the international position in general, but their net effect seems to have been to favor the use of equity financing in the UK relative to other countries.

However, if we are to use the UK as an experimental arena is disaggregating the effects of form of payment and bid hostility, the conflicting evidence from recent UK research on acquiring firms warrants further investigation. Gregory (1997) uses six different benchmarks, including the Fama-French (1996) "three factor" model, using both the product of one plus the abnormal return (Kothari and Warner (1997) "buy-and-hold" returns) and the cumulative abnormal returns (CARs) procedures, together with a modified RATS approach and consistently finds significant negative performance. From announcement to the 24 months post completion of the acquisition, these range from a significant -8.15% to a significant -18.01%. Limmack (1991) uses three alternative benchmarks and finds significant returns ranging between -4.67% and -14.96% after 24 months. On a size-controlled basis, Kennedy and Limmack (1996) also provide evidence of

[1] For example, Smith offers the example of Coloroll's acquisition of John Crowther (a bid that forms part of our sample) where the total goodwill write-off, taken direct to reserves (i.e. an example of "dirty surplus" accounting)

under-performance by UK acquirers with a significant -4.92% being reported for the period 12 to 24 months post takeover. Conn et al (2004) report abnormal returns of –19.78% after 36 months. Sudarsanam and Mahate (2003) use an accumulated abnormal returns approach and find abnormal returns of around –15% after three years, with evidence that "glamour" acquirers perform less well than "value" acquirers. In marked contrast, Franks and Harris (1989) and Higson and Elliott (1998) find no significant abnormal returns by UK acquirers. Franks and Harris show a significant positive return of +4.5% in the 24 months following takeover when the CAPM is used to define abnormal returns, whilst Higson and Elliott report abnormal returns (computed on a holding period returns basis comparing merging firm return with an equivalent short position in the size decile benchmark) of -1.14% after 24 months and +0.83% after 36 months. This raises the intriguing question as to whether or not the UK experience is different from that of the US, where negative abnormal returns to acquirers is now well-established (Agrawal et al [1992], Loughran and Vijh [1997]). A full survey of the literature on long-run acquirer returns in the UK and US can be found in Agrawal and Jaffe (2000).

Several possible explanations for the difference in findings between the various UK studies reported above. The first is that the results simply reflect time-varying returns to acquisition. To some degree, this would explain the difference between the Higson and Elliott (1998) results and those of Gregory (1997) and Limmack (1991). Higson and Elliott report positive acquirer abnormal returns for the years 1981-1984, whereas Gregory (1997) covers the period 1984 to 1992 inclusive, Sudarsanam and Mahate (2003) 1984-1995 and Conn et al (2004) 1984-1998. Apart from 1989, all other years in their study (1975-1990) show negative returns. Whilst there is considerable time variation in acquirer abnormal returns, it is unlikely that these explain the results obtained by Higson and Elliott (1998) in comparison to those presented by Limmack (1991), Gregory (1997) and Conn et al (2004).

The second explanation is that all of the UK studies to date suffer from some form of measurement bias. Biases in long run abnormal returns have been documented by Kothari and Warner (1997), Barber and Lyon (1997) and Lyon et al (1999). While it is more likely that such

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after allowing for the restatement of the acquired assets to a "fair value" and the creation of provisions for future

biases would lead to an over-estimate rather than an under-estimate of abnormal returns, these studies show that misspecification of abnormal returns and significance tests can lead to over-rejection of the null hypothesis even when the test is for significant negative CARs (e.g. Kothari and Warner, 1997, p.309). None of the studies referred to above employs the more sophisticated non-parametric testing methods advocated by Lyon et al (1999). The first contribution of this paper is to examine whether significant biases in the estimation of long run abnormal returns or misspecification of test statistics provide the explanation for the differences between US and UK studies. We show that when tests which control for the skewness and bias in the estimation of long run abnormal returns are properly carried out, using the methods prescribed in Lyon et al (1999), the negative performance of UK acquiring companies documented by Limmack (1991), Kennedy and Limmack (1996) and Gregory (1997) is confirmed by this study. The evidence here shows that the magnitude of these abnormal returns may even have been under-estimated by some previous studies.

Recently, Fama (1998) has argued that many apparent anomalies in the literature either disappear or become far less significant when abnormal returns are estimated in calendar, rather than event, time. This seems unlikely to be an explanation for the poor performance of acquirers, as Gregory (1997) shows that calendar time returns are more negative than event time returns. Furthermore, Conn et al (2004) report consistent results when calendar time returns are employed. However, given the potential problems of cross-correlation in abnormal returns when long post event windows are used (Fama, 1998), we also report calendar time returns here. We again show that significant negative abnormal returns accrue to acquiring firms, and show that these results are driven by the subset of equity-financing acquirers.

A major issue that emerges from the evidence for both UK and US studies is whether the time dependent pattern of acquirer performance is a reflection of genuine under-performance by acquirers, or whether this pattern reflects a failure to take account of time-varying expectations on the part of investors. This is analogous to the problem of measuring the performance of mutual fund managers where the returns required in equilibrium change over time. In the same

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restructuring costs, actually exceeded the amount paid for the company.

way that mean alphas can be used to measure fund manager performance, they can be used as a measure of abnormal returns, either in event time (Franks et al, 1991) or in calendar time (Loughran and Ritter, 1995). Using both event time and calendar time alphas from the Fama-French three-factor model as our measures of abnormal performance, we show that these central results are robust to specifications that control for performance conditional upon time-varying risk and expected return. In addition, we report results using the calendar time abnormal return (CTAR) method of Mitchell and Stafford (2000).

The testing of acquirer performance using Fama-French alphas in calendar time is likely to have low explanatory power if, as Loughran and Ritter (2000) argue, behavioral timing is a factor in acquisitions. In practice, management have discretion over both the timing of the bid and the method of its financing. Loughran and Ritter (*op. cit.*) contend that if firms exploit misvaluations through supply responses, as in the issuance of equity to finance acquisitions, then there will be time variation in portfolio abnormal returns. This motivates our calculation of conditional and unconditional alphas in event time as well as calendar time. However, a particular innovation in this study is that we go on to show that both form of financing and type of bid are contingent on macro-economic conditions, as proxied by a number of market and interest rate variables. This is entirely consistent with the Loughran and Ritter hypothesis and leads us to conclude that calendar time regressions may not be the most powerful way of detecting abnormal performance by bidders. Further, we find that returns in "hot" months appear to be more negative than returns in "cold" months, which is consistent with the recent finding of Moeller, Schlingemann and Stulz (2005).

We report results for cash, stock and mixed financing, and for hostile and friendly bids. We use this latter classification because, as Higson and Elliott (1998) note, there is no direct analogy in the UK to the merger/tender offer dichotomy. Furthermore, even for the US, Schwert (2000) provides evidence that hostility and tender offers are not totally correlated. Other papers have studied the effects of bidder hostility and form of payment, but this is the first to examine the interaction between hostility and form of payment. As may be expected from prior studies, acquirers offering cash perform better than acquirers financing deals using equity. As in

Loughran and Vijh (1997), we show equity-financing acquirers have significantly negative abnormal returns, but by contrast UK cash-financing acquirers do not have significant positive abnormal returns. Friendly acquirers exhibit significantly worse performance than hostile acquirers. However, we show that the form of payment and bidder hostility interact to explain post-acquisition returns. In support of the behavioral timing in line with the results reported by Rau and Vermaelen (1998) we show some evidence of a "value firm effect" in equity-financing bidder returns. We also show that highly valued firms are more likely to finance bids using equity, and that the propensity to issue equity is associated with periods of relatively high market valuation. Last, returns are lower following "hot" takeover periods than in "cool" periods.

Section II of the paper explains the research design and hypotheses tested; Section III describes in detail the metrics used to calculate abnormal returns; Section IV describes the sample; Section V gives the results from our different tests of acquirer performance; finally, Section VI summarizes the paper and draws conclusions.

II. Research design and hypotheses

Inter alia, Agrawal and Jaffe (2000) articulate two hypotheses to explain the performance of acquirers post bid. The first of these is the *form of payment hypothesis*, which is predicatively identical to either a "windows of opportunity" hypothesis or a "behavioral timing" hypothesis. The arguments here are that acquirers will be likely to opt for equity payment if either the firm is perceived to be relatively over-valued, or that equity is cheaper than any other form of financing. These are subtly different arguments. The first is compatible with Shleifer and Vishny's (2003) proposition 3, and suggests there will be firm level preferences for equity financing which may not aggregate at the market level. The second is in keeping with section 5.2 of Shleifer and Vishny.. In this situation there will be aggregate market level effects, so that we would expect to see more equity financing occurring in periods where market valuations in general are high. Testing the first effect may appear to be straightforward, but requires both care and some assumptions. One proxy for measuring *relative* "over valuation" is to use rankings based some valuation ratio that has been shown to predict future stock returns. An obvious candidate, that

has been used in previous US studies (e.g Rau and Vermaelen (1998)) and has been shown to be associated with future long-run returns in book the US and UK markets is the book to market ratio.[2] However, two potential difficulties emerge with regard to this metric. First, if market valuation ratios reflect the present value of future investment opportunities, then low book-to-market stocks will have a superior set of investment opportunities to high book to market stocks, and as such, according to the free cash flow hypothesis (Jensen, 1986) may find themselves having to use equity financing if they are to successfully fund all investment opportunities. This is the reasoning behind the acquisition announcement period tests in such studies as Lang, Stultz and Walking (1989), which find high *q*-ratio firms experience superior announcement period returns to low *q* firms. Unfortunately, recent evidence that looks at the *long run* returns to such acquirers finds no evidence supportive of the free cash flow hypothesis. A study of UK acquisitions by Gregory (2005) indicates that the long run returns for high *q* acquirers are generally poorer than those of low *q* acquirers, though the differences are only significant when cash flow is simultaneously controlled for. Under such circumstances, in complete contradiction to the predictions of the free cash flow hypothesis, firms with higher free cash flow and lower *q* ratios exhibit better 5 year post bid returns. For the set of UK firms at least, this suggests that *q*-ratios may do a poor job of predicting the true investment opportunity set. A second concern with the metric is that book-to-market ratios may reflect rational risk pricing. Some evidence for this has been presented in Liew and Vassalou (2000). Unfortunately, Gregory, Harris and Michou (2003) provide evidence that suggests that whilst the size effect in the UK appears to be associated with macro-economic risk, the book to market effect (as proxied by HML) does not appear to have a significant association once size and market risk factors are allowed for. Furthermore, at a portfolio level book-to-market related returns exhibit a perverse relationship with macro economic factors once the Fama-French factors are allowed for. In other words, taken as a whole, the evidence for book-to-market effects in the UK seems compatible with a mispricing story. Taking these two arguments together, we believe that *a priori* it is not unreasonable to use book to market as a proxy, albeit a crude one, for relative over or under valuation of stocks. However, this interpretation is testable. If there are mispricing effects, then we should see returns being related to an acquirer's book to market ratio. Furthermore, if

[2] For the UK evidence, see Gregory, Harris and Michou (2001).

acquirers seek to exploit these mispricing effects, as suggested by the behavioral timing hypothesis, then this relationship should be found in the equity financing group, but not in the cash financing group. Following the above arguments on behavioral timing, financing choice and returns, we have three testable hypotheses, namely:

H1a: Returns following equity-financed acquisitions will be lower than returns following cash-financed or mixed-financed (partial equity) acquisitions; and
H1b: Returns following cash-financed acquisitions will be higher than returns following mixed-financed (partial equity) acquisitions.

H2: Low book-to-market acquirers will be more likely to finance bids with equity.

H3: Low book-to-market acquirers that use equity financing will exhibit lower post bid returns than high book-to-market acquirers using equity financing.

The second set of hypotheses we wish to test relate to the form of the bid. The argument here is that hostile bids are more likely to result in bidder firm shareholder wealth gains than agreed bids, either because of the disciplinary nature of hostile bids, or because the danger of over-payment in order to ensure target management's approval is mitigated. For example, Shleifer and Vishny (2003) highlight this as a possible explanatory factor in target managers accepting an equity financed offer (their alternative explanation being that target managers have short horizons). This leads to our fourth hypothesis:

H4: Hostile bids will result in higher post bid returns than non-hostile bids.

We also examine the inter-action between H1 and H4, so we expect cash-financed hostile acquisitions to be the best performing acquisitions, and equity financed non-hostile bids to be the worst. We test hypotheses (1) through (4) by simple partitioning of the sample, using long run returns calculated from the bootstrapped and calendar time approaches described in Section III below. However, there are other implications that flow from the "behavioral timing" hypothesis

and Shleifer and Vishny's model that relate to aggregate behavior and returns. First, if managers indulge in such timing activity, returns following "hot" periods, for mergers should be poorer, leading to hypothesis 5:

H5: Returns following "hot" periods for merger activity will be lower than those following "cool" periods.

Further, we should expect to see more use of equity-financing when markets are "expensive" and conversely, we should expect to see more cash financing when markets are "cheap" and interest rates are low. The predicted effect of interest rates on equity bids is unclear. On the one hand, high interest rates will encourage equity financing as opposed to cash financing. On the other hand, high interest rates will depress economic activity and hence investment activity in general.

This leads to our final two hypotheses:

H6: Equity financing will be more prevalent than cash financing when aggregate stock market prices are high.

H7: Cash financing will be more prevalent than equity financing when interest rates are low.

We investigate these "behavioral timing" hypotheses directly, by regressing the number of bids of differing types on macro-economic variables that might reasonably proxy for market outlook and the "expensiveness" of the market. The question then arises as to which predictive factors are most appropriate to include in our model. We require predictions of the likely cost of equity and debt financing. One factor found to predict future stock returns is the lagged dividend yield ratio. However, for the UK, Harris and Sanchez-Valle (2000) have shown that the lagged ratio of the long Treasury Bond rate to dividend yield ratio (know as the "gilt-equity ratio" in UK markets) has considerably superior predictive power to dividend yield, having both stronger in sample and out of sample predictive ability.[3] This variable is *GEYR*. We supplement this by a measure of

[3] The authors find a similar pattern is found in the US though the predictive power is much lower than in the UK.

recent market performance, the previous quarter's return on the stock market in excess of the risk free rate (*LAGRMRF*). We also require a prediction of debt costs.[4] We note that long and short rates, and the term structure variable are highly correlated which is problematic when all three are included in the regression model with the gilt-equity yield ratio. We therefore run two separate regressions for each type of acquisition, one using the treasury bill rate (*LAGTBR*), and the other using the long bond rate as measures of borrowing costs *(LAGLONG*).

III. Models used to estimate long run abnormal returns

A. *Event Time methods*

Lyon et al (1999) note that the causes of misspecification include new listing or survivor bias, re-balancing bias, and skewness bias, and demonstrate that alternative methods are available to counter such biases. One uses traditional event-time modelling with inference based on either a boot-strapped version of a skewness adjusted t-statistic, or on empirical probability values calculated from a simulated distribution of mean long-run abnormal returns estimated from pseudo-portfolios. The alternative method involves accumulating calendar time returns. Lyon et al (1999, p. 198) note that both methods have advantages and disadvantages, and conclude that the "pragmatic solution" to the problem of analyzing long-run abnormal returns is to use both. We follow that advice here.

We first form the reference portfolios described in Lyon et al (1999) using UK data. We then apply this reference portfolio technique to the set of medium to large UK takeovers (defined as those in excess of £10 million) for 1977 through 1992 and calculate abnormal returns for the 5 years post takeover. We then use both techniques used by Lyon et al (1999) to correct for skewness bias in the t-statistics.

[4] Note that there is no reliable indicator of UK Corporate Bond yields for the early years of our sample.

Given the smaller size of the UK stock market compared to the US, we form 10 x 5 reference portfolios, sorted on size (market capitalization) and book-to-market ratios as at the 30th June of the year *t*-1 (as in Lyon et al, 1999). All share returns are from the *London Business School Share Price Database (LSPD)*, whilst all book-to-market ratios and market capitalization data are from *Datastream*. Reference portfolio and acquirer firm returns are calculated using the "buy-and-hold" method described in Lyon et al, (1999, p. 169):

$$R_{ps\tau}^{bh} = \sum_{i=1}^{n_s} \frac{\left[\prod_{t=s}^{s+\tau}\left(1+R_{it}\right)\right]-1}{n_s} \qquad (1)$$

where s is the beginning period, τ is the period of investment in months, R_{it} is the return on security i in month t, and n_s is the number of securities traded in month s, the first period for the return calculation. This represents the return on a passive investment portfolio with no monthly rebalancing.

Note that we sort on market capitalization in *descending* order (i.e. decile 1 contains the largest firms), whilst book-to-market is sorted in *ascending* order (i.e. quintile 1 contains low book-to-market or "glamour" firms). The reference portfolio returns show that there are substantial and non-linear size and book-to-market effects in the UK, which mirror those reported in Lyon et al (199, p.171). Three main points emerge: first, for all holding periods the returns for all periods are monotonically decreasing in size and increasing in book-to-market. Second, the general pattern of returns for size and book-to-market effects appear to be consistent between the UK and the US.

Given the conclusions in Lyon et al (1999) that buy-and-hold reference portfolios dominate rebalanced reference portfolios, we define the expected return on acquirer *i,* $[E(R_{i\tau})]$ as the reference portfolio buy-and-hold return given by (1). Abnormal returns are then defined as:

$$AR_{i\tau} = R_{i\tau} - E(R_{i\tau}) \qquad (2)$$

where $AR_{i\tau}$ is the τ period buy-and-hold abnormal return for acquirer i, and $R_{i\tau}$ is the τ period buy-and-hold return. We then test for significance of the abnormal return using the bootstrapped skewness-adjusted t-statistic described in equation (6) of Lyon et al (1999, p. 174) and the pseudo-portfolio method described in Lyon et al (1999, pp. 175-176). In all, we use 50 plus 10 reference portfolios to form the pseudo-portfolio returns. First, we use the 50 size and book to market portfolios described above. Second, given the evidence in Loughran and Ritter (*op. cit.*) that benchmark portfolios formed on size alone capture around 90% of true abnormal returns, as opposed to the approximately 80% captured by size and book-to-market benchmarks, we also report results using ten size-decile reference portfolios.[5] Evidence from Gregory, Harris and Michou (Tables 10-12, 2003) suggests that once size and market risk is allowed for, book-to-market and *HML* do not appear to have a significant association with macro-economic risk, in contrast to the market risk premium and SMB factors which do. As such, we place more reliance on the size-benchmarked results than the size and book-to-market matched results.

An alternative measure of performance in event time is the Fama-French three factor model. The Fama-French model is given by:

$$R_{i\tau} - R_{f\tau} = \alpha_i + \beta_i \left(R_{m\tau} - R_{f\tau}\right) + \gamma_i SMB_\tau + \delta_i HML_\tau + \varepsilon_{i\tau} \qquad (3)$$

where R_{ft} is the monthly return on three-month UK Treasury bills, $R_{m\tau}$ is the return on the (value weighted) FT All-Share Index, SMB_τ is the difference in return between small and large companies, and HML_τ is the difference in return between high and low book-to-market companies. The SML and HML factor portfolios are formed using the universe of UK stocks for which market capitalizations and returns, and book-to-market ratios are available on the *LSPD* and *Datastream* respectively. As in the Fama-French model, portfolios are formed using end-June book-to-market ratios and market capitalizations in year *t+1*, with returns being accumulated from July *t+1* to June *t+2*. We use a UK adaptation of that model here where

[5] Note that our simulation results suggest that the pseudo-portfolio method using buy-and-hold returns yields an unbiased measure of long-run abnormal returns for the UK.

portfolios are formed in a manner similar to that employed by Gregory and McCorriston (2004). Whereas Fama and French use the NYSE median to form breakpoints on size, and all NYSE stocks to form breakpoints on book-to-market, the UK stockmarket is characterized by a large number of small capitalization stocks. To avoid the problems that would be caused by setting breakpoints on the median of the whole market, we use the top 350 stocks to set size and book-to-market breakpoints.[6]

B. *Calendar time method*

Calendar time portfolios can either be formed using the model described in Loughran and Ritter (1995) which employs the Fama-French three-factor model, or by using the calendar time abnormal return method (CTAR) of Mitchell and Stafford (p. 318, 2000). We do both, and form calendar-time returns on a portfolio of acquirers which have, respectively, experienced an acquisition in the last twelve, thirty six, or sixty months. The calendar-time returns are then used to estimate the regression:

$$R_{pt} - R_{ft} = \alpha_i + \beta_i \left(R_{mt} - R_{ft}\right) + \gamma_i SMB_t + \delta_i HML_t + \varepsilon_{\mathrm{it}} \qquad (4)$$

where R_{pt} is the equally-weighted monthly return on the calendar-time portfolio. Lyon et al (1999, p. 193, fn.12) note that the error term may be heteroskedastic as the number of securities in the portfolio varies from one month to the next. However, they find that this does not affect their results to any significant degree. Nonetheless, to take account of this possibility we estimate the calendar time regressions using the White (1980) correction for heteroskedasticity.

The alternative CTAR model calculates the abnormal return for any calendar month as:

$$CTAR_t = R_{pt} - E(R_{pt}) \qquad (5)$$

[6] We choose this cut-off because the FTSE includes all stocks in the top 350 companies in its FTSE 350 index, designed to capture the returns on small and medium size UK companies.

The expected return on the event portfolio is proxied by the return on the ten size reference portfolios described above. We use size-matched portfolios for the reasons previously explained.

C. *Conditional Performance Method*

Recent work has shown that the assumption of unconditional asset pricing models may be flawed (Jaganathan and Wang, 1995). If the true asset pricing process is a conditional one, a failure to take account of this will result in the "bad model" problem referred to in Fama (1998). In such circumstances, unconditional models of stock returns could confuse abnormal performance with time variations in risks or risk premia. To investigate whether the "bad model" problem has any role to play in explaining the performance of acquirers, we re-estimate our calendar time results under the assumption that coefficients are conditioned in the manner suggested in Ferson and Schadt (1996). Conditioning models have not been as widely tested on UK data as in the US. However one study which found significant information in conditioning variables in the UK and other countries was due to Solnik (1993). Accordingly, we use three of the conditioning variables used by Solnik (1993) which are, respectively: (1) the lagged level of the one-month Treasury bill yield; (2) a lagged dividend yield (the yield on the FT All-Share Index); and (3) a lagged measure of the term structure of interest rates (the UK ten year Government Bond rate).[7] Note that a quality spread variable is not available for the UK for the period of our study.

In calendar time, we use a conditional Fama-French three factor model of the form:

$$R_{pt} - R_{ft} = \alpha_{0i} + \beta_{0i}\left(R_{mt} - R_{ft}\right) + \beta'_{1i}\left(z_{t-1}\left[R_{mt} - R_{ft}\right]\right) + \gamma_{1i} SMB_t + \delta_{1i} HML_t + \varepsilon_{\mathrm{it}} \qquad (6)$$

where z_{t-1} is the vector of conditioning variables described above.

Unfortunately, running (5) in event time is expensive in terms of degrees of freedom. For our conditional event time regressions we therefore run the conditional model in Fama and French

[7] We also ran the model using a January dummy. Results were qualitatively similar.

(1997) where SMB and HML are conditioned upon the previous month end log of market capitalization and book-to-market ratios respectively.[8]

IV Sample data

The data set consists of all successfully completed UK industrial and commercial company takeovers from 1977 to 1994 with a bid value of £10 million or greater[9]. Although this cut-off is inevitably somewhat arbitrary, the value has been chosen to avoid the results being excessively influenced by very small deals. This cut-off is also used in Gregory (1997). The sample is drawn from the *AMDATA* database for all takeovers announced since 1984 (the date of introduction of the *AMDATA* service, which offers a comprehensive listing of all bids made for UK listed companies by UK companies), and before that date from the *Financial Times*. Our initial sample of firms meeting these criteria is 776 firms. Additional requirements are then imposed by the models used. We estimate holding period returns models where size alone is controlled for and where both size and book to market are controlled for (as in Lyon et al., *op. cit*.). For these models, we require that each acquirer's share returns must be available on the *LSPD* and that matching records for the firm can be found on *Datastream* for the announcement period. These requirements reduce the sample to 550 bids. We further require that the acquirer's market capitalization and its book-to-market ratio must be available on *Datastream* each month, for as long as the acquirer continues in business. This further reduces the sample to 486 acquirers. As an additional model, we also estimate simple event time regressions of the form used in Franks and Harris (1989), which require that returns be available on the *LSPD* from announcement to a minimum of 12 months after the month of announcement of the bid. This results in a sub-sample of 480 acquirers.

[8] In contrast to Fama and French, we use absolute book-to-market ratio to condition HML rather than the log of the ratio, because of the small number of cases in the UK where book-to-market ratios are negative. This is possible in the UK because of "dirty surplus" accounting that allowed firms (pre 1997) to write off goodwill directly against reserves.

[9] We exclude investment trusts and banks, in part because of the different nature of book-to-market ratios and also because such ratios, required for portfolio matching, are unavailable on *Datastream*. The cut-off excludes roughly one third of our dataset of UK takeovers by number, as there are a large number small takeovers.

Summary data on acquirers by size and book-to-market classifications are presented in Table 2 Panel A. Acquirers tend to be concentrated in the largest two deciles of market capitalization, with 63.1% of the sample falling into this category. Only 6.1% of the sample are in the smallest four deciles by market capitalization. By contrast, acquirers are fairly evenly distributed across book-to-market quintiles, although there is a slight tendency towards a concentration at the lower end of the book-to-market spectrum. Notably, only around 11.5% of the sample fall into the highest book-to-market quintile.

Sub-analyses of the sample split cash versus non-cash, and hostile versus non-hostile are also reported in Table 2 Panel A. Further analysis reveals that the size decile distribution of the cash sample is different from that of the non-cash sample. Cash financing acquirers tend to be significantly larger than non-cash financing acquirers. Furthermore, cash acquirers tend to be concentrated in the middle book-to-market quintiles, whilst non-cash acquirers are monotonically decreasing in book-to-market quintile. Most striking, however, is the distribution of type of financing across book-to-market quintile reported in Table 2, Panel B. The proportion financing by equity decreases monotonically across quintiles, precisely the effect to be expected under the Loughran and Ritter "behavioral timing" hypothesis. At the "glamour" end of the spectrum, 69.5% of bidders use equity, a further 11.9% finance by mixed offers, whilst only 18.9% of bidders finance using cash. In contrast, at the "value" end, Only 53.6% of bids are financed using equity, 14.3% use mixed offerings, whilst fully 32.1% use cash. The evidence here is clearly supportive of Hypothesis 2. Of course, one explanation is that book-to-market is a proxy for investment opportunities. However, if this is the reason Hypothesis 2 is supported then there should be no pattern in the subsequent long run abnormal returns. In other words, if this alternative explanation is valid, then Hypothesis 3 should be rejected.

We also see from Table 2, Panel A, that the size and book-to-market distributions of hostile and non-hostile bidders are not significantly different from one another. However, when we break down the distributions according to both form of financing and hostility, in Table 2 Panel C, some interesting differences emerge. First, note that the book-to-market distribution of hostile and non-hostile takeovers is very similar. However, there are differences in the size distribution.

65.7% of hostile equity acquirers are in the two largest market capitalization deciles, whilst 51.5% of non-hostile acquirers are in these deciles. The relatively small number of hostile cash acquirers are predominantly large firms that are located towards the "value" end of the book-to-market spectrum.

V. Results

A1. Event Time portfolios – basic analysis

Our first and most simple test is to run cross-sectional Fama-French three-factor regressions and conditional Fama-French regressions. These require a minimum of 12 months post-announcement data and so can be estimated for 480 companies in our sample. The regressions are run on the full 60 months post announcement and results from the unconditional regressions are shown in Panel A of Table 3. The overall alpha is significantly negative at 0.17% per month. The beta implies that acquirers are, on average, slightly riskier than the market average, whilst the three-factor coefficients show a significant positive loading on the SMB (size) risk factor but no significant loading on HML. Partitioning the sample into non-cash and cash acquirers in our first, and most simple, test of Hypotheses 1a and 1b confirms the results from previous studies that equity acquirers have strongly negative abnormal performance (-0.21% per month; Table 3, Panel B), while cash acquirers have performance that is not significantly different from zero. Neither are mixed bids significantly different from zero. Note also that the rank ordering of the form of payment is as predicted by the form of payment hypothesis (Agrawal and Jaffe, 2000). Partitioning on bid hostility shows that non-hostile bids are significantly negative, whilst hostile bids exhibit returns not significantly different from zero, providing evidence in support of hypothesis 4. Following Rau and Vermaelen (*op. cit*), we classify bids according to whether they are "value" or "glamour" bidders. However, whilst Rau and Vermaelen partition their sample on a relative basis (i.e. the top 50% of acquirers by BTM are "value" firms), we partition on an absolute basis (i.e. on the basis of the BTM quintile to which the acquirer belongs). By this definition the majority of our acquirers would be "glamour" firms. From table 3, Panel C, in keeping with Rau and Vermaelen's findings, there is distinct evidence of a "glamour" effect once

acquirers are partitioned into "glamour" (quintiles 1 and 2) and "value" (quintiles 4 & 5) categories. Overall, "glamour" acquirers lose a significant 0.39% per month whilst "value" acquirers gain an insignificant 0.01% per month. The sub-analysis of equity acquirers (the "glamour" acquirers of which would be expected to perform particularly adversely under the behavioural timing hypothesis [Loughran and Ritter, *op. cit.*] of Hypothesis 3) presented in Table 3, Panel D shows that "glamour acquirers significantly under-perform (0.41% per month) whilst "value" acquirers exhibit no such under-performance.

Our second group of tests use the Fama-French (1997) conditional 3-factor model. These figures are reported in Table 4 and are qualitatively similar to those described above. Overall under-performance is a significant 0.17% per month, whilst equity bidders significantly under-perform (0.23% per month) as do non-hostile bidders (0.23% per month). As might be expected, conditioning SMB and HML reduces the difference between value and glamour returns, but not by much. Glamour acquirers now show a significant -0.37% per month return, whilst value acquirers have an insignificant alpha equivalent to 0.07% per month. For the equity sub-sample, glamour acquirers have a significant abnormal return of -0.39% per month, whilst value acquirers have an insignificant positive alpha equivalent to 0.02% per month.

A2. Event Time portfolios – bootstrapped analysis

The experiments conducted in Kothari and Warner (1997) provide evidence that the Fama-French three-factor model may exhibit biases when used to estimate long-run returns. Furthermore, the problems which Loughran and Ritter (2000) raise with regard to the Fama-French model, which we discuss in Section II above, suggest that the use of Fama-French alphas, or a CAR approach using the three-factor model, are unlikely to yield a powerful test of under-

performance by acquirers. For that reason, for our event-time results we prefer to rely on the Lyon et al analysis of acquirer returns.

First we use Lyon et al (1999) style buy-and-hold book-to-market and size (BTMS) reference portfolios, which demonstrate that acquirers exhibit substantial negative performance. The results which are reported in Table 5, Panel A, columns 1-5, show negative abnormal returns of –3.2% after 12 months and –15.1% after 36 months, rising to – 21.2% after 5 years. Using either a skewness adjusted t-test, or empirical p-values based upon simulations of the pseudo-portfolios, the abnormal returns are significantly negative in all cases. Taking account of the Loughran and Ritter (*op. cit.*) arguments for size controls, columns 6-10 show the results when the ten deciles are used as the benchmark portfolios rather than the 50 BTMS portfolios. Under this metric, acquirer abnormal returns are a significant –3.6%, -17.1% and –25.6% after one, three and five years respectively.

We then analyze the BTMS matched results by book-to-market quintile in Table 5, Panel B. In contrast to the results from the analysis of Jensen alphas reported in Table 3, no clear value versus glamour effect emerges from returns calculated on a BTMS matched basis, with the exception that the extreme value portfolio exhibits the highest returns across all time periods, with an insignificant overall 5 year return of only -0.4%. Given the smaller number of observations necessarily associated with sub-dividing the sample, significance levels for the remaining groups are somewhat mixed, although all four remaining quintiles exhibit significant negative performance after 36 months, at least at the 10% level, whether pseudo-portfolio or bootstrapped skewness-adjusted t-statistics are used to calculate significance. Combining portfolios (not reported in Table 4) in the way described above yields a significant negative 60 month performance of –24.9% for the "glamour" group; however, the "value" group is also significantly negative, though with a lower abnormal return of –19.2%. Our way of interpreting this difference between the Jensen alpha analysis and the pseudo-portfolio analysis is that the latter shows that *relative* to similar book-to-market ratio firms, acquirers tend to fare badly in all but the highest market-to-book quintile. However, in absolute terms, "value" acquirers do rather less poorly. In essence this is because the performance of value firms in general is superior to

that of glamour firms, although whether or not this difference represents a risk effect is an open question. Gregory, Harris and Michou (2003) present evidence that there are "value" anomalies in the UK market that do not seem to represent risk factors. As previously noted, in some contrast to the evidence presented in Liew and Vassalou (2002), it is debatable as to whether HML captures macroeconomic risk, although SMB clearly does (Gregory et al, *op.cit.*, Tables 8-10). This evidence is compatible with the Loughran and Ritter (*op.cit.*) argument that size benchmarked returns may be more appropriate measures of performance than BTMS benchmarked returns – and as we have already demonstrated in Table 5, Panel A, the size-benchmarked abnormal returns are consistently worse than the BTMS-benchmarked abnormal returns. Although the time period and methodology differ, our results here are in line with those reported for 1984-1998 by Conn et al (2004), although they provide less detailed groupings and do not sub-analyze equity and cash acquirers.[10]

Strikingly, when we analyze the size-matched results by book-to-market quintile in Panel C of Table 5, we see clear evidence that the "glamour" set of acquirers exhibit economically and statistically significant negative returns. BTM quintile 1 firms have abnormal returns of –10.1% after 12 months rising to –40.3% after 60 months, whilst BTM quintile 2 firms show returns of –6.2% after 12 months rising to –48.6% after 60 months. By contrast, the 60 month abnormal returns for the "neutral" BTM quintile 3 portfolio are only –16.6% after 60 months, compared to a figure of –12.7% for BTM 4 firms and +15.5% for the extreme "value" portfolio.

In a direct test of Hypotheses 1a and 1b, Table 6 shows the BTMS-matched and size-matched results for equity, cash and mixed bids respectively. Taking the BTMS-matched results from Panel A, for equity bids, returns are economically and statistically significantly negative for all time horizons under both metrics. Abnormal returns are –5.3% after one year, -20.7% after 3 years and go on to reach –30.5% after 5 years. By contrast, cash acquirers exhibit performance that is insignificantly different from zero. Neither is the magnitude of the returns economically significant (-0.1% after 1 year, -2.6% after three years, and +5.6% after five years). Mixed offers exhibit negative abnormal returns of –26.3% after 5 years, but the figure is not statistically

[10] The Conn et al study reports results on a control firm matched size and book-to-market basis in calendar time.

significant, a result which partially reflects the low number of bidders in this class (n=59). In general, the ordering of these results provides support for the Agrawal and Jaffe (*op. cit*.) form of payment hypothesis. Turning to the size-matched results in panel B of Table 6, we note that the qualitative results are identical, but abnormal returns are considerably more negative for the equity group (-36.4% after 60 months compared to a BTMS figure of –30.5%), slightly less for the cash-financing group, and very slightly worse for the mixed financing group.

Given striking differences between the performances of equity and cash bidders, we test Hypothesis 3 by analyzing the performance of both groups by BTM quintile in Table 7. Panel 1A shows the BTMS-matched quintile results for equity bidders. With the notable exception of quintile 4 bidders, abnormal returns are more negative in the low BTM quintiles after 60 months, with the least negative (and insignificant) returns being recorded by the "value" BTM group, quintile 5. All the other quintile groups exhibit significant negative performance, with the 60 month returns for quintiles 1 (glamour) through 5 (value) being –39.2%, -31.8%, -23.7% -38.1%, and –5.0% respectively. The evidence here is broadly supportive of the Rau and Vermaelen "value firms" effect and our Hypothesis 3, but even bidders towards the "value" end of the spectrum which finance by equity do poorly to some extent. However, when we look at the results on a size matched basis presented in panel 1B, we see strong evidence in favor of the "value firms" effect hypothesized by (3). Returns are monotonically decreasing as we move from "value" to "glamour" quintiles, with both "value" groupings showing performance insignificantly different from zero, whilst "neutral" and "glamour" firms have significant negative performance, ranging from –23.2% (significant at the 10% level under the pseudo-portfolio method only) for BTM 3 firms, to –53.6% for BTM 4 acquirers and –59.8% for the extreme "glamour" set of acquirers. The pattern of returns exhibited here is entirely compatible with the Shleifer and Vishny (2003) story of stock-market driven acquisitions.

Turning to cash bidders, the results reported in Table 7 Panel 2A are not terribly informative because of the low significance levels, almost certainly driven by the small number of bidders in each quintile. Combining quintiles into the "glamour" and "value" categories described above still fails to yield statistically significant results; the glamour cash bidders earn (statistically

insignificant) abnormal returns of +29.5% after 60 months, whilst value cash bidders have (statistically insignificant) abnormal returns of –13.8% after 60 months. A broadly similar story results from the size matched results reported in Panel 2B. However, combining the cash and equity financing results and bearing in mind the results from Table 2, panel B, that show bidders appear to gear the financing of the bid according to the book-to-market quintile of the firm reveal a general pattern of evidence that is compatible with managers following "behavioral timing" as hypothesized by Loughran and Ritter (*op. cit.*) and Sheifer and Vishny (*op. cit.*). That is, managers in the "glamour" category of firms that are over-valued exploit this position by issuing new equity to finance bids - these acquirers subsequently under-perform significantly. By contrast, managers in the "glamour" category of firms that are not over-valued have no incentive to exploit their position and use cash to finance bids - these acquirers subsequently do not under-perform. However, some caution is necessary in arriving at this interpretation because of the lack of significance of the results for cash bidders in general.[11]

In testing Hypothesis 4, we present results partitioned by bid hostility in Table 8. From the BTMS results reported in Panel A, we see that for non-hostile bidders, the long run performance is unambiguously negative, no matter how significance is evaluated. Columns 3-4 of Table 8 show that non-hostile bidders in the UK have significant abnormal returns of –4.4% after 12 months, -18.4% after 36 months and –23.6% after 60 months. By contrast, the returns for hostile bidders are always insignificant, with the abnormal returns being –0.6%, -4.4% and –13.5% for the three horizons respectively. Under the size-matched metric reported in Panel B, the conclusions for non-hostile bidders are identical. Returns are somewhat more negative, at –26.5% after 60 months. However, the hostile group of acquirers exhibit considerably poorer performance under this metric and there is weak evidence from the bootstrapped skewness adjusted t-statistic that this negative performance may be significant.

The evidence from the event-time analysis thus far seems conclusive. For acquisitions completed during the period 1977-1994, UK acquiring firms significantly under-performed their pseudo-portfolio equivalents. This confirms the findings of Limmack (1991), Kennedy and

[11] Note that we do not report quintile results for mixed-financing bidders because of the small number of

Limmack (1996), and Gregory (1997), but contradicts those of Higson and Elliott (1998). Sub-analyzing the sample suggests that:

1. the form of payment is an important determinant of post-bid performance, in line with US findings and Hypotheses 1a and 1b;
2. "friendly" bids significantly under-perform, in support of Hypothesis 4;
3. In support of Hypothesis 3, there is some evidence of a "glamour" firms effect in UK takeovers, but only the extreme quintile of value firm bidders show performance which is not significantly different from zero when the size and BTMS-matched metric is employed.

B. *The effects of hostility and cash offers*

As we noted above, the UK market facilitates the disaggregation of the effects of both the form of financing (equity, cash or mixed offers) and bid hostility. In Table 9, we present results that are partitioned simultaneously on hostility and form of financing. A problem with such a partitioning is that the relatively small number of observations outside the largest group (equity financed non-hostile bids) leads to demanding levels of abnormal returns for significance to be established. Nonetheless, on a BTMS-matched basis (Table 9, Panel A) we observe that returns for equity financing are more negative than those observed for non-equity acquirers, and that returns for hostile bids are greater than those associated with non-hostile bids. This is the case whether returns are measured at 1, 3 or 5 year intervals. Equity financed non-hostile acquisitions exhibit highly significant negative performance at all horizons. Whilst equity financed hostile bids show economically significant returns, these are only statistically significant after 5 years when the skewness-adjusted t-statistic is considered. However, on a size-matched basis (Table 9, Panel B) it appears that hostile equity financed bids also exhibit negative performance. Under this metric, the 60 month post bid returns are –37% for non-hostile equity bids, and –34.1% for equity-financed hostile bids. The performance of cash non-hostile bids is not significantly different from zero under either metric. However, the group of cash financed hostile bids exhibit 5 year abnormal returns of just over 50% under the BTMS-matched benchmark. These are significant at the 10% level using the pseudo-portfolio significance test. Although numbers are

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observations in each quintile grouping.

similar using the size-matched benchmark, at 49.5%, the figure just fails to be significant at the 10% level.

Overall, these results suggest that although form of payment may be the dominant explanatory factor, the type of bid also has an important inter-active role in explaining bidder outcomes, particularly for cash-financed acquisitions.

C. *Calendar time results*

One explanation for the significance of the results reported in Tables 5-9 is that cross-sectional dependence of the abnormal returns causes the significance level to be overstated. To test for this, we form calendar time portfolios as described above, and run the monthly regression of calendar time returns implied by equations (4) and (6), together with the CTAR method described in (5). We do not report the results from the Fama-French model in detail given that Mitchell and Stafford (p. 321, 2000) note that the CTAR methodology is "plagued by fewer statistical flaws", but draw attention to any differences that arise under the Fama-French method. The CTAR results are reported in Table 10. They show that equity financing acquirers return a significant –0.429% per month average return (results from the Fama-French calendar time regressions in (4) and (6) reveal smaller but still significant abnormal returns). Ignoring compounding effects, this is equivalent to –25.74% over the 5-year post-acquisition period. This is smaller than the -36.35% size-matched BHAR reported for equity-financing acquirers in Table 6 but considerably larger than the abnormal returns implied by the alpha coefficients in Tables 3 and 4. Nonetheless, the statistical inferences from all methods are unambiguous when it comes to equity financed acquisitions. The real surprise from the calendar time results is that cash bids are, at the 10% level at least, also significantly negative, with returns being –0.26% per month (Table 10, panel A), equivalent to –15.6% after 5 years, ignoring compounding effects, which contrasts with the event time result of an insignificant +3%. Under the Fama-French calendar time approach from (4) and (6), the monthly alpha is again negative (-0.137% and –0.131% respectively) for cash bids, but not significant. Partitioning on hostility confirms the event time results from Table 8 in that friendly bids exhibit strong negative performance of –0.49% per

month, significant at the 1% level. The scale of this result is marginally greater than that found under the event time BHARs.[12] Hostile bids exhibit performance that is not significantly different from zero..

As Loughran and Ritter (2000) argue, if managers of acquiring firms exhibit "behavioral timing" in formulating their decisions, then calendar time weighting will bias any experiment in favor of the null hypothesis. Furthermore, according to H5, we would expect returns to be lower following "hot" periods of M&A activity. We report results in Panel B of Table 10 from examining "hot" periods, defined as those where the number of firms in the portfolio is greater than the median. As would be expected under the Loughran and Ritter hypothesis, "hot period" or "high intensity month" abnormal returns to equity financed acquisitions are considerably worse at –0.511% per month, significant at the 1% level. Turning to cash-financed acquisitions, the "hot" period results in Panel B of Table 10 show that high-intensity bid months are far worse than the whole sample period. Looking at "hot" months reveals that CTARs for hostile bids during this period are–0.385% per month, significant at the 10% level. Only in the case of friendly bids are the results for "hot" months in Panel B of table 10 no worse than those for all months. Taken as a whole, the results indicate that mergers undertaken in "hot" periods fare worse than those in "cold" periods. This stands in some contrast to the results reported in Mitchell and Stafford (2000, Table 8 and pp. 317-318), who find that acquirer returns in calendar time are not systematically related to event intensity.

Table 11, Panel A presents calendar time returns for two-way partitions by form of financing and bid hostility. In calendar time, only equity-financed non-hostile (-0.498% per month) and cash-financed non-hostile bids (-0.338% per month) exhibit significant negative performance (note that the latter are negative but not significantly so when estimated using the Fama-French methods described in [4] and [6]). Intriguingly, equity-financed hostile bids do better than cash-financed non-hostile bids in these tests. Last, cash-financed hostile bids do not exhibit performance significantly different from zero, and the scale of the returns implied by the abnormal return of 0.2% per month is much less than that obtained from the event-time results.

[12]Overall calendar time results from (4) and (6) give qualitatively similar results.

However, once we separate out "hot" periods (Table 11, panel B) we see that abnormal performance worsens considerably for both equity "friendly" bids and equity non-hostile bids – the latter are now significantly negative. The same is true with regard to the results for cash non-hostile bids. Only the conclusions in respect of cash hostile bids remain unaffected by the sub-analysis of "hot" periods.

D. Bid Timing Results

Clearly, there are important weighting differences between event period returns and calendar time returns. If, following Shleifer and Vishny, and as hypothesized in H6 and H7, there is a propensity to use more equity financing in "good" times when stock prices are high, and more cash financing in "bad" times when stock prices are lower, then as Loughran and Ritter (2000) note, calendar time portfolios thus formed are inherently biased towards supporting the null hypothesis. If managers really do have timing ability, they will tend to carry out more stock financed acquisitions when stock prices are high, and so weighting each time period equally will ignore this important aspect of timing. In particular, this will tend to understate the (negative) significance of stock-financing acquirer returns.

In order to test hypotheses 6 and 7, we can accumulate bids either monthly or quarterly for the purposes of this analysis. We use quarterly data in the results reported, to avoid the problem of a preponderance of zero bids in some months for the sub-analyses (particularly cash bid sub-analysis), but also repeat the analysis using monthly data, when results are qualitatively similar. These data are so-called "count" data, meaning that OLS regressions are not appropriate. The approach required can be either a poisson regression or a negative binomial regression, depending on the distribution of the dependent variable. Tests (see Greene, 2000, chapter 19) indicate that in general our count data are not poisson distributed, and our results are reported using the negative binomial model. These regressions are reported in Table 12, and the results are striking. First note that in general acquisition activity is driven by the expensiveness of the market as proxied by *GEYR*, the more fully valued the market, the greater the likelihood of bid activity, whereas activity is negatively associated with long run interest rates (*LAGLONG*).

Compatible with hypotheses 6 and 7, equity financed bids are more likely to be observed when the gilt-equity rate is high (that is, when markets are "expensive"). When the long interest rate model is used, equity bids are more likely when equity markets are "expensive" and less likely when long interest rates are high. By contrast, cash bids are more likely to be observed when market performance is poor (as measured by *LAGRMRF*) and when long run interest rates are low.[13]

VI. Conclusions

First, this paper has shown that the poor performance of UK acquirers cannot be explained by biases in the estimation of long run abnormal returns, nor mis-specification of test statistics resulting from forming portfolios in event time rather than calendar time. We have also shown that using a conditional form of the three-factor model leads to qualitatively similar results. This first result is an important one because it confirms that the UK experience is similar to that suggested by recent US studies, and is not one of zero abnormal performance as suggested by the recent work of Higson and Elliott (1998). On average, UK acquirers have under-performed in a manner similar to that shown to apply to US acquirers by Agrawal et al (1992). Furthermore, we have shown that it is equity acquirers that exhibit substantial negative abnormal returns, as shown for the US by Loughran and Vijh (1997). However, whilst we find UK equity financing acquirers exhibit significant negative abnormal returns to their US counterparts, we do not find that UK cash acquirers earn significant positive returns.

Our evidence is strongly supportive of the "form of payments" hypothesis suggested by Agrawal and Jaffe (2000). Importantly, the "natural experiment" suggested by the nature of the UK market for corporate control shows that whilst form of payment considerations tend to dominate the nature of the bid (degree of hostility) in determining long-run acquirer returns, the inter-action of the form of payment and nature of the bid are important in explaining performance. Equity financed friendly bids exhibit economically and statistically significant negative performance under all metrics. Cash financed hostile bids show some weak evidence of

[13] Note that the predictive model using short run rates is not statistically significant so is not reported.

exhibiting positive post bid performance, although the conclusions drawn on this are metric dependent and do not hold in the calendar time analysis.

We also provide evidence that acquirers in the highest book-to-market quintiles appear to have better performance than other quintile groups. This finding is compatible with the "performance extrapolation" hypothesis of Agrawal and Jaffe (2000), the "value" effect found in Rau and Vermaelen (1998) and the Shleifer and Vishny (2003) explanation that acquisitions are driven by market valuation characteristics.

We obtain stronger results in event time than in calendar time. In event time we show that equity financed hostile bids also exhibit negative performance. These differences between the event time and calendar time regressions led us to examine directly the "behavioral timing" hypothesis of Loughran and Ritter (2000). We find evidence to support this hypothesis, and in particular find that the form of financing appears to be chosen as would be expected given a "windows of opportunity" hypothesis. In such circumstances, as Loughran and Ritter point out, tests based upon calendar time regressions will be biased towards supporting the null hypothesis. Sub-analysis of "hot" periods in calendar time confirms the results we obtain from the event-time BHAR approach. For this reason we place more weight upon our results from the event time tests rather than the calendar time regressions.

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Table 1: Shareholding patterns (in percent) in the UK and US, 1970-1995

UK DATA	PENSION FUNDS	INSURANCE COS	UNIT TRUSTS	IINVESTMENT TRUSTS & OTHER FIN. INST.	BANK PERSONAL TRUSTS	FOREIGN	INDIVIDUALS & CHARITIES	OTHER	TOTAL	INSTITUTION-AL TOTAL
1975	16.8	15.9	4.1	10.5	N/A	5.6	39.8	7.3	100	47.3
1981	26.7	20.5	3.6	6.8	N/A	3.6	30.4	8.4	100	57.6
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		INSTITUTION-AL TOTAL
1970	9.2	3.3	4.7	0.5	10.5	3.2	68.0	0.6	100	17.7
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/.

Table 2: Summary data. **Panel A:** Acquirers by market capitalization decile and book-to-market quintile. For Market Capitalisation Deciles, 1 is the largest and 10 the smallest. For Book-to-Market Quitiles, 1 is Low (i.e. "Glamour") whilst 5 is high (i.e. "value")

DECILE/ QUIN-TILE	MKT. CAP	BTM	MKT. CAP %	BTM %	MKT. CAP	BTM	MKT. CAP %	BTM %	MKT. CAP	BTM	MKT. CAP %	BTM %	MKT. CAP	BTM	MKT. CAP %	BTM %	MKT. CAP	BTM	MKT. CAP %	BTM %
Group	*Overall*	*Overall*	*Overall*	*Overall*	*Cash*	*Cash*	*Cash*	*Cash*	*Non-cash*	*Non-cash*	*Non-cash*	*Non-cash*	*Hostile*	*Hostile*	*Hostile*	*Hostile*	*Non-hostile*	*Non-hostile*	*Non-hostile*	*Non-hostile*
1	197	118	40.5%	24.3%	73	22	61.9%	18.6%	124	96	33.7%	26.1%	53	30	46.5%	26.3%	144	88	38.7%	23.7%
2	110	116	22.6%	23.9%	21	24	17.8%	20.3%	89	92	24.2%	25.0%	29	26	25.4%	22.8%	81	90	21.8%	24.2%
3	69	106	14.2%	21.8%	14	25	11.9%	21.2%	55	81	14.9%	22.0%	9	23	7.9%	20.2%	60	83	16.1%	22.3%
4	34	90	7.0%	18.5%	4	29	3.4%	24.6%	30	61	8.2%	16.6%	12	23	10.5%	20.2%	22	67	5.9%	18.0%
5	28	56	5.8%	11.5%	3	18	2.5%	15.3%	25	38	6.8%	10.3%	6	12	5.3%	10.5%	22	44	5.9%	11.8%
6	18		3.7%		1		0.8%		17		4.6%		3		2.6%		15		4.0%	
7	13		2.7%		0		0.0%		13		3.5%		1		0.9%		12		3.2%	
8	8		1.6%		1		0.8%		7		1.9%		0		0.0%		8		2.2%	
9	5		1.0%		1		0.8%		4		1.1%		0		0.0%		5		1.3%	
10	4		0.8%		0		0.0%		4		1.1%		1		0.9%		3		0.8%	
Total	486	486	100%	100%	118	118	100%	100%	368	368	100%	100%	114	114	100%	100%	372	372	100%	100%

Panel B: Proportion of bidders in each book to market quintile choosing cash, equity or mixed financing

TYPE	N	MEAN	N	MEAN	N	MEAN	N	MEAN	N	MEAN
Quintile	1. (low BTM)		2		3		4		5.(high BTM)	
CASH	118	18.64%	116	20.69%	106	23.59%	90	32.22%	56	32.14%
EQUITY	118	69.49%	116	68.10%	106	62.26%	90	57.78%	56	53.57%
MIXED	118	11.86%	116	11.21%	106	14.15%	90	10.00%	56	14.29%

Panel C: Acquirers by market capitalization decile and book-to-market quintile partitioned by form of financing and bidder hostility. For Market Capitalisation Deciles, 1 is the largest and 10 the smallest. For Book-to-Market Quitiles, 1 is Low (i.e. "Glamour") whilst 5 is high (i.e. "value")

DECILE/QUINTILE	MKT. CAP	BTM	MKT. CAP %	BTM %	MKT. CAP	BTM	MKT. CAP %	BTM %	MKT. CAP	BTM	MKT. CAP %	BTM %	MKT. CAP	BTM	MKT. CAP %	BTM %
Group	Equity non-host	Equity non-host	Equity non-host	Equity non-host	Equity Host	Equity Host	Equity Host	Equity Host	Cash Non-host	Cash Non-host	Cash Non-host	Cash Non-host	Cash Host	Cash Host	Cash Host	Cash Host
1	72	64	30.1%	26.8%	29	18	41.4%	25.7%	58	17	59.8%	17.5%	15	5	71.4%	23.8%
2	52	59	21.8%	24.7%	17	20	24.3%	28.6%	18	23	18.6%	23.7%	3	1	14.3%	4.8%
3	41	51	17.2%	21.3%	7	15	10.0%	21.4%	13	21	13.4%	21.6%	1	4	4.8%	19.0%
4	18	43	7.5%	18.0%	9	9	12.9%	12.9%	3	20	3.1%	20.6%	1	9	4.8%	42.9%
5	18	22	7.5%	9.2%	5	8	7.1%	11.4%	2	16	2.1%	16.5%	1	2	4.8%	9.5%
6	13		5.4%		2		2.9%		1		1.0%		0		0.0%	
7	12		5.0%		1		1.4%		0		0.0%		0		0.0%	
8	7		2.9%		0		0.0%		1		1.0%		0		0.0%	
9	4		1.7%		0		0.0%		1		1.0%		0		0.0%	
10	2		0.8%		0		0.0%		0		0.0%		0		0.0%	
sum	239	239	100%	100%	70	70	100%	100%	97	97	100%	100%	21	21	100%	100%
Glam				51.5%				54.3%				41.2%				28.6%
Val				27.2%				24.3%				37.1%				52.4%

Table 3: Event time returns from FF 3-factor model. Results are coefficients for the entire sample in Panel A, and Jensen alphas (monthly) for the sub-analyses reported in panels B to D. All coefficients are calculated over the period up to 60-months post bid. Sub-analyses are presented by form of financing, bid hostility and book-to-market ratio of acquirer.

Panel A

Sub-analysis	*Overall*	*Overall*	*Overall*	*Overall*
Factor	Rm-Rf	SMB	HML	Alpha
Mean	1.0942	0.6057	0.0468	-0.0017
t-test	66.1212	14.6758	1.1965	-2.2638

Panel B

Sub-analysis	*Cash Bid*	*Equity bid*	*Mixed bid*	*Hostile*	*Non-hostile*
	alpha	alpha	alpha	alpha	alpha
Mean	-0.0008	-0.0021	-0.0011	-0.0008	-0.0020
t-test	-0.5114	-2.1943	-0.7522	-0.5464	-2.3827

Panel C

Sub-analysis	*Overall*	*Overall*	*Overall*	*Overall*	*Overall*	*Overall*	*Overall*
	BTM1	BTM2	BTM3	BTM4	BTM5	Glamour	Value
	alpha	alpha	alpha	alpha	alpha	alpha	alpha
Mean	-0.0026	-0.0051	-0.0004	0.0006	0.0017	-0.0039	0.0010
t-test	-1.4153	-3.7393	-0.2304	0.4768	1.0802	-3.3539	1.0653

Panel D

Sub-analysis	*Equity*	*Equity*	*Equity*	*Equity*	*Equity*	*Overall*	*Overall*
	BTM1	BTM2	BTM3	BTM4	BTM5	Glamour	Value
	alpha	alpha	alpha	alpha	alpha	alpha	alpha
Mean	-0.0028	-0.0054	-0.0007	0.0005	0.0008	-0.0041	0.0006
t-test	-1.2675	-3.2292	-0.2405	0.3613	0.3996	-2.9501	0.5339

Table 4: Event time returns from conditional FF 3-factor model. Results are coefficients for the entire sample in Panel A, and Jensen alphas (monthly) for the sub-analyses reported in panels B to D. SMB and HML are conditioned upon the previous month end log of market capitalization and book-to-market ratios respectively. All coefficients are calculated over the period up to 60-months post bid. Sub-analyses are presented by form of financing, bid hostility and book-to-market ratio of acquirer.

Panel A

Sub-analysis	*Overall*	*Overall*	*Overall*	*Overall*
Factor	Rm-Rf	SMB	HML	Alpha
Mean	1.0951	1.9686	0.1980	-0.0017
t-test	59.9787	2.3035	0.2829	-2.1948

Panel B

Sub-analysis	*Cash Bid*	*Equity bid*	*Mixed bid*	*Hostile*	*Non-hostile*
	alpha	alpha	alpha	alpha	alpha
Mean	-0.0006	-0.0023	-0.0008	-0.0003	-0.0023
t-test	-0.3306	-2.3023	-0.5910	-0.2116	-2.4781

Panel C

Sub-analysis	*Overall*	*Overall*	*Overall*	*Overall*	*Overall*	*Overall*	*Overall*
	BTM1	BTM2	BTM3	BTM4	BTM5	Glamour	Value
	alpha	alpha	alpha	alpha	alpha	alpha	alpha
Mean	-0.0030	-0.0044	-0.0006	0.0003	0.0014	-0.0037	0.0007
t-test	-1.4911	-3.4766	-0.2932	0.2599	0.9083	-3.1211	0.7840

Panel D

Sub-analysis	*Equity*	*Equity*	*Equity*	*Equity*	*Equity*	*Overall*	*Overall*
	BTM1	BTM2	BTM3	BTM4	BTM5	Glamour	Value
	alpha	alpha	alpha	alpha	alpha	alpha	alpha
Mean	-0.0032	-0.0047	-0.0015	0.0002	0.0002	-0.0039	0.0002
t-test	-1.5155	-2.9485	-0.4633	0.1336	0.1185	-2.9680	0.1784

Table 5: Overall bidder returns. Figures show excess returns with pseudo-portfolio significance levels, followed by bootstrapped skewness adjusted t-statistic. Significance levels are shown for the t-statistics and for the Lyon et al (1999) pseudo-portfolio sampling method. Significance levels are denoted by * (10%), **(5%), and ***(1%) using two-tailed tests. Two alternative matching procedures are presented: BTMS denotes book-to-market and sized matched excess returns, whilst size-matched denotes excess returns benchmarked against decile portfolios only. Panel A presents the overall results. Panel B presents the results partitioned by book to market quintile when bidder returns are BTMS matched; Panel C presents the returns partitioned by book to market quintile when returns are size-matched.

Panel A: Overall results

Pseudo Portfolio Sampling results: BTMS matched				**Pseudo Portfolio Sampling results: Size-matched**			
Year 1	Excess bidder return	-0.03188 **	486	Year 1	Excess bidder return	-0.03666 **	486
Year 3	Excess bidder return	-0.1513 ***	486	Year 3	Excess bidder return	-0.17123 ***	486
Year 5	Excess bidder return	-0.21231 ***	486	Year 5	Excess bidder return	-0.25559 ***	486
Bootstrapped Skewness-adjusted t-statistics: BTMS matched			No. of Observations	**Bootstrapped Skewness-adjusted t-statistics: Size-matched**			No. of Observations
Year 1	T-statistic	-2.05504 **	486	Year 1	T-statistic	-2.34277 ***	486
Year 3	T-statistic	-4.53277 ***	486	Year 3	T-statistic	-5.05093 ***	486
Year 5	T-statistic	-3.5939 ***	486	Year 5	T-statistic	-4.30281 ***	486

Panel B: Results partitioned on book-to-market quintile – BTMS matched

	Quintile/*no. obs in quintile*	**1**	***118***	**2**	*116*	**3**	*106*	**4**	*90*	**5**	*56*
Pseudo Portfolio Sampling results:											
Year	**Statistic**	Value	Sig. level	Value	Sig. level	Value	Sig. level	Value	Sig. level	Value	Sig. level
Year 1	Excess bidder return	-0.05976	ns	-0.02691	ns	-0.0341	ns	-0.0552	*	0.058296	ns
Year 3	Excess bidder return	-0.16979	*	-0.14684	*	-0.1162	*	-0.23653	***	-0.05102	ns
Year 5	Excess bidder return	-0.20362	ns	-0.29611	***	-0.1583	ns	-0.30888	**	-0.00408	ns
Bootstrapped Skewness-adjusted t-statistics:											
Year 1	T-statistic	-1.60275	ns	-0.88012	ns	-1.01028	ns	-1.98242	*	1.541671	ns
Year 3	T-statistic	-2.1434	*	-2.25774	**	-1.80637	*	-3.28174	***	-0.51297	ns
Year 5	T-statistic	-1.68823	ns	-1.92373	*	-1.32902	ns	-2.42343	**	-0.01902	ns

Panel C: Results partitioned on book-to-market quintile – size matched

	Quintile/*no. obs in quintile*	**1**	***118***	**2**	*116*	**3**	*106*	**4**	*90*	**5**	*56*
Pseudo Portfolio Sampling results:											
Year	**Statistic**	Value	Sig. level	Value	Sig. level	Value	Sig. level	Value	Sig. level	Value	Sig. level
Year 1	Excess bidder return	-0.10102	***	-0.06246	*	-0.02028	ns	-0.01766	ns	0.090812	ns
Year 3	Excess bidder return	-0.30721	***	-0.26079	***	-0.10077	ns	-0.10859	ns	0.066792	ns
Year 5	Excess bidder return	-0.40311	***	-0.48566	***	-0.16604	ns	-0.12667	ns	0.155143	ns
Bootstrapped Skewness-adjusted t-statistics:											
Year 1	T-statistic	-2.69516	**	-2.00466	*	-0.56972	ns	-0.66475	ns	2.605857	**
Year 3	T-statistic	-3.6001	**	-3.68392	***	-1.61986	ns	-1.6844	ns	0.744349	ns
Year 5	T-statistic	-3.30671	***	-2.5874	**	-1.45673	ns	-1.12569	ns	1.171669	ns

Table 6: Bidder excess returns by form of payment. Figures show excess returns with pseudo-portfolio significance levels, followed by bootstrapped skewness adjusted t-statistic. Significance levels are shown for the t-statistics and for the Lyon et al (1999) pseudo-portfolio sampling method. Significance levels are denoted by * (10%), **(5%), and ***(1%) using two-tailed tests. Two alternative matching procedures are presented: BTMS denotes book-to-market and sized matched excess returns, whilst size-matched denotes excess returns benchmarked against decile portfolios only. Panel A presents the results partitioned by form of financing when bidder returns are BTMS matched; Panel B presents the returns partitioned by form of financing when returns are size-matched.

Panel A: BTM and size-matched

	Classification/*no. obs in class*	Equity	*309*	Cash	*118*	mixed	*59*
Pseudo Portfolio Sampling results:							
Year	**Statistic**	Value	Sig. Level	Value	Sig. Level	Value	Sig. Level
Year 1	Excess bidder return	-0.05346	***	-0.0011	ns	0.019621	ns
Year 3	Excess bidder return	-0.20731	***	-0.0264	ns	-0.10775	ns
Year 5	Excess bidder return	-0.30515	***	0.056245	ns	-0.2632	ns
Bootstrapped Skewness-adjusted t-statistics:							
Year 1	T-statistic	-2.60527	**	-0.01634	ns	0.669567	ns
Year 3	T-statistic	-5.37981	***	-0.34902	ns	-1.0129	ns
Year 5	T-statistic	-4.53835	***	0.46846	ns	-1.59562	ns

Panel B: Size-matched

	Classification/*no. obs in class*	Equity	*309*	Cash	*118*	mixed	*59*
Pseudo Portfolio Sampling results:							
Year	**Statistic**	Value	Sig. Level	Value	Sig. Level	Value	Sig. Level
Year 1	Excess bidder return	-0.05869	***	0.000157	ns	0.005072	ns
Year 3	Excess bidder return	-0.24124	***	-0.02172	ns	-0.10355	ns
Year 5	Excess bidder return	-0.36352	***	0.03472	ns	-0.27096	ns
Bootstrapped Skewness-adjusted t-statistics:							
Year 1	T-statistic	-2.77644	***	0.020836	ns	0.175367	ns
Year 3	T-statistic	-6.01467	***	-0.29984	ns	-0.95471	ns
Year 5	T-statistic	-5.25016	***	0.314019	ns	-1.60064	ns

Table 7: Bidder results partitioned on book-to-market quintile. Figures show excess returns with pseudo-portfolio significance levels, followed by bootstrapped skewness adjusted t-statistic. Significance levels are shown for the t-statistics and for the Lyon et al (1999) pseudo-portfolio sampling method. Significance levels are denoted by * (10%), **(5%), and ***(1%) using two-tailed tests. Two alternative matching procedures are presented: BTMS denotes book-to-market and sized matched excess returns, whilst size-matched denotes excess returns benchmarked against decile portfolios only. Panel 1A presents the equity bidder results partitioned by book to market quintile when bidder returns are BTMS matched; Panel 1B presents the equity bidder results partitioned by book to market quintile when returns are size-matched. Panel 2A presents the cash bidder results partitioned by book to market quintile when bidder returns are BTMS matched; Panel 2B presents the cash bidder results partitioned by book to market quintile when returns are size-matched.

Panel 1A: Equity bidder results – BTM and size matched

	Quintile/*no. obs in quintile*	**1**	***82***	**2**	***79***	**3**	***66***	**4**	***52***	**5**	***30***
Pseudo Portfolio Sampling results:											
Year	**Statistic**	Value	Sig. level	Value	Sig. level	Value	Sig. level	Value	Sig. level	Value	Sig. level
Year 1	Excess bidder return	-0.11827	**	-0.05124	ns	-0.0163	Bidders:	-0.07049	*	0.065571	ns
Year 3	Excess bidder return	-0.31717	***	-0.1457	*	-0.16051	*	-0.24686	***	-0.10364	ns
Year 5	Excess bidder return	-0.39207	***	-0.31845	***	-0.2374	**	-0.38134	**	-0.04951	ns
Bootstrapped Skewness-adjusted t-statistics:											
Year 1	T-statistic	-2.73502	***	-1.50981	ns	-0.31395	ns	-1.94512	*	1.145492	ns
Year 3	T-statistic	-4.17478	***	-2.00484	*	-1.77896	ns	-2.85727	**	-0.85609	ns
Year 5	T-statistic	-3.31441	***	-2.58902	**	-1.27203	ns	-2.75843	**	-0.31162	ns

Panel 1B: Equity bidder results – size matched

	Quintile/*no. obs in quintile*	**1**	***82***	**2**	***79***	**3**	***66***	**4**	***52***	**5**	***30***
Pseudo Portfolio Sampling results:											
Year	**Statistic**	Value	Sig. level	Value	Sig. level	Value	Sig. level	Value	Sig. level	Value	Sig. level
Year 1	Excess bidder return	-0.1718	***	-0.09294	***	0.010686	ns	-0.021	ns	0.122679	ns
Year 3	Excess bidder return	-0.47948	***	-0.29314	***	-0.14353	ns	-0.08202	ns	0.05569	ns
Year 5	Excess bidder return	-0.5977	***	-0.53569	***	-0.23169	*	-0.19317	ns	0.144676	ns
Bootstrapped Skewness-adjusted t-statistics:											
Year 1	T-statistic	-3.77332	***	-2.72111	**	0.254834	ns	-0.61024	ns	2.328995	ns
Year 3	T-statistic	-5.8012	***	-3.80008	***	-1.65184	ns	-1.05267	ns	0.482759	ns
Year 5	T-statistic	-4.38326	***	-4.0493	***	-1.31611	ns	-1.59706	ns	0.820986	ns

Panel 2A: Cash bidder results – BTM and size matched

	Quintile/*no. obs in quintile*	**1**	***22***	**2**	***24***	**3**	***25***	**4**	***29***	**5**	***18***
Pseudo Portfolio Sampling results:											
Year	**Statistic**	Value	Sig. level	Value	Sig. level	Value	Sig. level	Value	Sig. level	Value	Sig. level
Year 1	Excess bidder return	0.061165	ns	0.024339	ns	-0.09467	**	-0.01266	ns	0.037467	ns
Year 3	Excess bidder return	0.41348	ns	-0.21505	ns	-0.05166	ns	-0.24224	*	0.070305	ns
Year 5	Excess bidder return	0.607077	ns	0.009812	ns	-0.0195	ns	-0.30847	ns	0.137714	ns
Bootstrapped Skewness-adjusted t-statistics:											
Year 1	T-statistic	0.726263	ns	0.329696	ns	-2.59873	**	-0.22686	ns	0.633771	ns
Year 3	T-statistic	1.887877	ns	-1.13137	ns	-0.59227	ns	-1.69454	ns	0.798332	ns
Year 5	T-statistic	1.80422	ns	0.126832	ns	-0.16524	ns	-1.20789	ns	0.869261	ns

Panel 2B: Cash bidder results – size matched

	Quintile/*no. obs in quintile*	**1**	***22***	**2**	***24***	**3**	***25***	**4**	***29***	**5**	***18***
Pseudo Portfolio Sampling results:											
Year	**Statistic**	Value	Sig. level	Value	Sig. level	Value	Sig. level	Value	Sig. level	Value	Sig. level
Year 1	Excess bidder return	0.04408	ns	0.015611	ns	-0.10395	*	0.011772	ns	0.051749	ns
Year 3	Excess bidder return	0.32515	*	-0.2488	ns	-0.07213	ns	-0.15801	ns	0.146683	ns
Year 5	Excess bidder return	0.366329	ns	-0.11751	ns	-0.10556	ns	-0.12034	ns	0.277044	ns
Bootstrapped Skewness-adjusted t-statistics:											
Year 1	T-statistic	0.541903	ns	0.220851	ns	-2.97309	***	0.26923	ns	0.908505	ns
Year 3	T-statistic	1.616216	ns	-1.2388	ns	-0.85833	ns	-1.20729	ns	1.543781	ns
Year 5	T-statistic	1.110423	ns	-0.16073	ns	-0.82935	ns	-0.51479	ns	1.624557	ns

Table 8: Bidder returns partitioned by hostility. Figures show excess returns with pseudo-portfolio significance levels, followed by bootstrapped skewness adjusted t-statistic. Significance levels are shown for the t-statistics and for the Lyon et al (1999) pseudo-portfolio sampling method. Significance levels are denoted by * (10%), **(5%), and ***(1%) using two-tailed tests. Two alternative matching procedures are presented: BTMS denotes book-to-market and sized matched excess returns, whilst size-matched denotes excess returns benchmarked against decile portfolios only. Panel A presents the results partitioned by bidder hostility when bidder returns are BTMS matched; Panel B presents the returns partitioned by bidder hostility when returns are size-matched.

Panel A: BTM and size-matched

	Classification/*no. obs in class*	Non-hostile	*372*	Hostile	*114*
Pseudo Portfolio Sampling results:					
Year	**Statistic**	Value	Sig. Level	Value	Sig. Level
Year 1	Excess bidder return	-0.04378	***	0.006963	ns
Year 3	Excess bidder return	-0.18426	***	-0.04375	ns
Year 5	Excess bidder return	-0.23592	***	-0.13526	ns
Bootstrapped Skewness-adjusted t-statistics:					
Year 1	T-statistic	-2.56712	***	0.203052	ns
Year 3	T-statistic	-4.83495	***	-0.60358	ns
Year 5	T-statistic	-3.37338	***	-1.12108	ns

Panel B: Size-matched

	Classification/*no. obs in class*	Non-hostile	*372*	Hostile	*114*
Pseudo Portfolio Sampling results:					
Year	**Statistic**	Value	Sig. Level	Value	Sig. Level
Year 1	Excess bidder return	-0.04858	***	0.002204	ns
Year 3	Excess bidder return	-0.19475	***	-0.09447	ns
Year 5	Excess bidder return	-0.26498	***	-0.22495	ns
Bootstrapped Skewness-adjusted t-statistics:					
Year 1	T-statistic	-2.83449	***	0.073951	ns
Year 3	T-statistic	-5.13689	***	-1.23991	ns
Year 5	T-statistic	-3.76408	***	-1.84514	*

Table 9: Bidder returns partitioned by hostility and form of financing. Figures show excess returns with pseudo-portfolio significance levels, followed by bootstrapped skewness adjusted t-statistic. Significance levels are shown for the t-statistics and for the Lyon et al (1999) pseudo-portfolio sampling method. Significance levels are denoted by * (10%), **(5%), and ***(1%) using two-tailed tests. Two alternative matching procedures are presented: BTMS denotes book-to-market and sized matched excess returns, whilst size-matched denotes excess returns benchmarked against decile portfolios only. Panel A presents the results partitioned by form of financing and bidder hostility when bidder returns are BTMS matched; Panel B presents the returns partitioned by form of financing and bidder hostility when returns are size-matched.

Panel A: BTM and size-matched

		Equity Non-hostile		Equity Hostile		Cash Non-hostile		Cash Hostile	
	Classification/no. obs in class	239		70		97		21	
Pseudo Portfolio Sampling results:									
Year	**Statistic**	Value	Sig. Level	Value	Sig. Level	Value	Sig. Level	Value	Sig. Level
Year 1	Excess bidder return	-0.05948	***	-0.03291	ns	-0.02287	ns	0.099468	ns
Year 3	Excess bidder return	-0.23732	***	-0.10484	ns	-0.08473	ns	0.242982	ns
Year 5	Excess bidder return	-0.32903	***	-0.22361	ns	-0.04011	ns	0.501299	*
Bootstrapped Skewness-adjusted t-statistics:									
Year 1	T-statistic	-2.7123	***	-0.63179	ns	-0.63697	ns	1.397333	ns
Year 3	T-statistic	-5.42128	***	-1.26032	ns	-1.07078	ns	1.247969	ns
Year 5	T-statistic	-4.05489	***	-1.77465	*	-0.23534	ns	1.577418	ns

Panel B: Size-matched

		Equity Non-hostile		Equity Hostile		Cash Non-hostile		Cash Hostile	
	Classification/no. obs in class	239		70		97		21	
Pseudo Portfolio Sampling results:									
Year	**Statistic**	Value	Sig. Level	Value	Sig. Level	Value	Sig. Level	Value	Sig. Level
Year 1	Excess bidder return	-0.06506	**	-0.03697	ns	-0.01896	ns	0.088468	ns
Year 3	Excess bidder return	-0.25742	***	-0.186	ns	-0.0784	ns	0.240093	ns
Year 5	Excess bidder return	-0.37015	***	-0.34087	*	-0.06485	ns	0.494655	ns
Bootstrapped Skewness-adjusted t-statistics:									
Year 1	T-statistic	-2.90639	***	-0.68279	ns	-0.55294	ns	1.294683	ns
Year 3	T-statistic	-5.87395	***	-1.97757	*	-1.05582	ns	1.312384	ns
Year 5	T-statistic	-4.55105	***	-2.41845	**	-0.41134	ns	1.729451	ns

Table 10.Calendar Time Abnormal Returns. Calendar time abnormal returns (CTARs) are calculated on the basis proposed in Mitchell and Stafford (2000) where portfolio abnormal returns are calculated relative to each security's size-matched benchmark.

Panel A: All months

	Equity	Cash	Non-hostile	Hostile
Mean CTAR	-0.00429	-0.0026	-0.0049	-0.00088
No. of Observations	272	267	272	269
T-test	-2.16602	-1.83361	-3.67188	-0.51091

Panel B: High intensity months, defined as those months where the number of observations in any month is greater than the median number of observations

	Equity	Cash	Non-hostile	Hostile
Mean CTAR	-0.00511	-0.00323	-0.00455	-0.00385
No. of Observations	137	131	136	134
T-test	-3.854	-2.347	-3.424	-2.627

Table 11.Calendar Time Abnormal Returns: Form of financing and hostility subset results. Calendar time abnormal returns (CTARs) are calculated on the basis proposed in Mitchell and Stafford (2000) where portfolio abnormal returns are calculated relative to each security's size-matched benchmark.

Panel A: All months

	Equity Non-hostile	Equity Hostile	Cash Non-hostile	Cash Hostile
Mean CTAR	-0.00498	-0.00219	-0.00338	0.00203
No. of Observations	272	242	267	261
T-test	-2.329	-1.314	-2.21409	0.867955

Panel B: High intensity months, defined as those months where the number of observations in any month is greater than the median number of observations

	Equity Non-hostile	Equity Hostile	Cash Non-hostile	Cash Hostile
Mean CTAR	-0.00548	-0.00426	-0.0035	-0.00026
No. of Observations	136	130	134	122
T-test	-3.603	-2.571	-2.084	-0.088

Table 12. Negative binomial regressions of number of quarterly mergers on macro-economic indicators. Dependent variables the number of quarterly acquisitions of differing types. Independent variables are the lagged level of the long run government bond ("gilt") yield to equity dividend yield ratio (*GEYR*), the previous quarter's return on the market, over and above the risk free rate (*LAGRMRF*), the lagged level of the one-month Treasury bill yield (*LAGTBR*), and the lagged UK ten year Government Bond rate (*LAGLONG*). Figures in parentheses are the probability levels of the z-statistics of the coefficients in a two-tailed test.

	ALL	ALL	EQUITY	EQUITY	CASH
GEYR	1.285	1.667	1.683	2.187	0.448
	(0.00)	(0.00)	(0.00)	(0.00)	(0.33)
LAGRMRF	-0.789	-1.307	-0.13	-0.96	-2.045
	(0.30)	(0.06)	(0.90)	(0.30)	(0.08)
LAGTBR	-0.021		-0.028		
	(0.38)		(0.39)		
LAGLONG		-0.226		-0.319	-0.136
		(0.00)		(0.00)	(0.02)
CONSTANT	-1.893	-0.575	-3.231	-1.306	-0.118
	(0.00)	(0.32)	(0.00)	(0.09)	(0.91)
Pseudo R2	0.026	0.08	0.035	0.103	0.018