Biases in Estimating Long Run Abnormal Returns and Conditional Measures of Performance: The Evidence on Takeovers Re-Examined.

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Abstract

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. Equity financed acquisitions and non-hostile bids generate negative returns, and their combination in a bid is particularly detrimental. Overall, neither cash financing nor bidder hostility generate positive abnormal returns. However, there is some evidence that the combination of cash financing and hostility that uniquely generates positive shareholder returns.

In using this experimental arena, we note that recent UK research has produced conflicting evidence on the previously documented stock market 'anomaly' of acquiring firms exhibiting substantial negative abnormal returns following acquisitions. 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]).

We show that when tests are used which control for the skewness and bias in the estimation of long run abnormal returns, as prescribed in Lyon et al (1999), the negative performance of UK acquiring companies documented by Limmack (1991), Kennedy and Limmack (1996), Gregory (1997) and Conn et al (2004) is confirmed. The evidence here shows that the magnitude of these abnormal returns may have been under-estimated by previous studies. 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. We also show that these results are robust to specifications which control for performance conditional upon time-varying risk and expected return measures and for returns calculated in calendar rather than event time.

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I. Introduction

Despite mixed evidence on whether shareholders actually benefit from acquisitions, the level of acquisition and merger activity appeared to accelerate rather than decelerate in the run-up to the new millennium. Furthermore, the UK and Europe became the focus of some deals hitherto unprecedented in scale during that period. For example, in 1999, Securities Data Corporation records that 41% of the $855bn first quarter global acquisition and merger volume occurred in Europe, as opposed to 30% one year previously. Examples included the BP Amoco deal, BP-Amoco's acquisition of Atlantic Richfield, Vodafone's hostile acquisition of Mannesman and Olivetti's hostile bid for Telecom Italia. 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 EC 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 which 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 (equivalent to tender offers) are stock-financed, very close to the 63.2% of non-hostile bids ("mergers") finaced 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.

Given the above, 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 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. 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 (Aggrawal 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 Aggrawal 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 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 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). 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.

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 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 our results are robust to specifications which control for performance conditional upon time-varying risk and expected return.

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.

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. 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. Last, 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.

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

II. 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, they 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 abnormal 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.

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.[1]

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 portfolios are formed in a manner similar to that employed by Gregory and McCorriston (2003). 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.[2]

B. *Calendar time method*

Calendar time portfolios are formed using the model described in Loughran and Ritter (1995) which employs the Fama-French three-factor model. We form calendar-time returns on a

[1] 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.

[2] 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.

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.

C. *Conditional Performance Method*

Recent work has shown that the assumption of unconditional asset pricing models may be flawed (Jaganathan and Wang, 1995). This appears not to have been taken into account in the "anomalies" literature. 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 (1992) 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). 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:

$$R_{pt} - R_{ft} = \alpha_{0i} + \beta_{0i}\left(R_{mt} - R_{ft}\right) + \beta'_{1i}\left(z_{t-1}\left[R_{mt} - R_{ft}\right]\right) + \gamma_{1i} SMB_t + \delta_{1i} HML_t + \varepsilon_{\mathrm{it}} \quad (5)$$

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 (1997) where SMB and HML are conditioned upon the previous month end log of market capitalization and book-to-market ratios respectively.[3]

III Sample data

The data set consists of all successfully completed UK takeovers from 1977 to 1994 with a bid value of £10 million or greater. 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 by UK listed companies), and before that date from the *Financial Times*. The additional requirements that are then imposed depend upon the model 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 Lton et al., *op. cit.*). For these models, we require that each acquirer's share returns must be available on the *LSPD* for the announcement period and that the acquirer's market capitalization and its book-to-market ratio must be available on *Datastream* each month. This yields a sample of 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 sample of 480 acquirers.

[3] 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

Summary data on acquirers by size and book-to-market classifications are presented in Table 1 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 1 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 1, 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.

Finally, in Table 1, Panel A, we see that the size and book-to-market distributions of hostile and non-hostile bidders are not significantly different from one another.

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the UK because of "dirty surplus" accounting that allowed firms (pre 1997) to write off goodwill directly against reserves.

IV. 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 2. 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 confirms the results from previous studies that equity acquirers have strongly negative abnormal performance (-0.21% per month; Table 2, 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 (Aggrawal 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. 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 2, Panel C, in keeping with Rau and Vermaelen's findings, there is distinct evidence of a "glamour" effect once acquires 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 a behavioural timing hypothesis [Loughran and Ritter, *op. cit.*]) presented in Table 2, 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 3 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 4, 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 4, Panel B. In contrast to the results from the analysis of Jensen alphas reported in Table 2, 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. Furthermore, 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 4, 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.[4]

Strikingly, when we analyze the size-matched results by book-to-market quintile in Panel C of Table 4, 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.

Table 5 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 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 Aggrawal and Jaffe (*op. cit*.) form of payment hypothesis. Turning to the size-matched results in panel B of Table 5, we note that the qualitative results are identical, but abnormal returns are considerably more negative for the equity group (-36.4% after 60 months

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

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 analyze the performance of both groups by BTM quintile in Table 6. 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, but even "value" bidders financing 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 Rau and Vermaelen "value firms" effect. 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 compatible with the Shleifer and Vishny (2003) story of stock-market driven acquisitions.

Turning to cash bidders, the results reported in Table 6 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 1, 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 arriving at this interpretation because of the lack of significance of the results for cash bidders in general.[5]

Results partitioned by bid hostility are presented in Table 7. 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 7 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 is 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 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; 2. "friendly" bids significantly under-perform; 3. there is some (but not conclusive) 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.

[5] Note that we do not report quintile results for mixed-financing bidders because of the small number of observations in each quintile grouping.

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. This can be achieved either by partitioning the data or by using dummy variables as independent variables in regressions with the Lyon et al (1999) style "buy-and-hold" abnormal returns calculated after controlling for size and book to market effects, as described above (N = 486). In Table 8, we present partitioned results. A problem here 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 8, 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 financing 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 8, 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 non-equity non-hostile bids is not significantly different from zero under either metric. However, the group of non-equity 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 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 Table 4 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 (5). The results are reported in Table 9, and all t-statistics are corrected for heteroskedasticity using the White (1980) method. 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. Yet whether an unconditional or a conditional Fama-French model is used in the analysis, the regression results reported in Table 10 unambiguously support the conclusions in Table 4. Acquirers, on average, significantly under-perform. The magnitude of the returns implied by the intercept terms (between 17.4% and 18% ignoring compounding effects) is not much different from the 60-month event period returns reported in Table 4 (given the Fama-French model is being employed in calendar time, the appropriate comparisons will always be with the BTMS-matched returns).

To confirm the form of payment hypothesis, we investigate the calendar time results for stock-financing acquirers. The results in calendar time confirm the fact that equity financing acquirers under-perform. The intercept coefficients in Table 10 for equity acquirers (-0.37 and –0.34) represent 60-month returns of –22.2% and –20.4% respectively, ignoring compounding effects. These represent returns substantially below those of –30.5% reported in Table 5, suggesting that calendar time accumulation mitigates the adverse returns experienced by equity bidders. However, there are important weighting differences between event period returns and calendar time returns. Note that there is a propensity for equity financing to correlate with returns on the market in general. Thus we see more equity financing in "good" times when stock prices are high, and more cash financing in "bad" times when stock prices are lower. 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. This will tend to understate the (negative) significance of stock-financing acquirer returns – in short, precisely the effects we see here. The

calendar time analysis confirms the non-significant results for cash financed acquirers. Last, calendar time returns are significantly negative for non-hostile bids, and insignificant for hostile bids.

Table 10 presents calendar time returns for two-way partitions by form of financing and bid hostility. In calendar time, only equity-financed non-hostile bids exhibit significant negative performance. Intriguingly, equity-financed hostile bids do better (although not significantly so) 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 intercept is less than half that obtained from the event-time results.

V. Conclusions

This paper has shown that the poor performance of UK acquirers can be explained neither 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. Thus we conclude that the "bad model" problem does not affect our central conclusion that UK acquirers exhibit under-performance compared to well-specified pseudo-portfolios.

This is an important results 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 Aggrawal 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 financing hostile bids show some weak evidence of exhibiting positive post bid performance, although the conclusions drawn on this are metric dependent.

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 Sheifer and Vishny (2003) explanation that acquisitions are driven by market valuation characteristics.

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Table 1: Summary data. Panel A: Acquirers by market capitalization decile and book-to-market quintile.

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 %	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%

Table 2: Event time returns from FF 3-factor model. Results are Jensen alphas (monthly). 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 3: Event time returns from conditional FF 3-factor model. Results are Jensen alphas (monthly). 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 4: Overall bidder returns Figures show bootstrapped skewness adjusted t-statistic and excess returns. 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. BTMS denotes book-to-market and sized matched excess returns, whilst size-matched denotes excess returns benchmarked against decile portfolios only.

Panel A: Overall results

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
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

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*
Bootstrapped Skewness-adjusted t-statistics:											
Year	**Statistic**	Value	Sig. level	Value	Sig. level	Value	Sig. level	Value	Sig. level	Value	Sig. level
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
Pseudo Portfolio Sampling results:											
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	-0.20362	ns	-0.29611	***	-0.1583	ns	-0.30888	**	-0.00408	ns

return

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*
Bootstrapped Skewness-adjusted t-statistics:											
Year	**Statistic**	Value	Sig. level	Value	Sig. level	Value	Sig. level	Value	Sig. level	Value	Sig. level
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
Pseudo Portfolio Sampling results:											
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

Table 5: Bidder excess returns by form of payment. Figures show bootstrapped skewness adjusted t-statistic and excess returns. 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.

Panel A: BTM and size-matched

	Classification/*no. obs in class*	Equity	*309*	Cash	*118*	mixed	*59*
Bootstrapped Skewness-adjusted t-statistics:							
Year	**Statistic**	Value	Sig. Level	Value	Sig. Level	Value	Sig. Level
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
Pseudo Portfolio Sampling results:							
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

Panel B: Size-matched

	Classification/*no. obs in class*	Equity	*309*	Cash	*118*	mixed	*59*
Bootstrapped Skewness-adjusted t-statistics:							
Year	**Statistic**	Value	Sig. Level	Value	Sig. Level	Value	Sig. Level
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
Pseudo Portfolio Sampling results:							
Year 1	Excess bidder return	-0.05869	***	0.000157	ns	0.005072	ns
Year 3	Excess bidder	-0.24124	***	-0.02172	ns	-0.10355	ns

	return			
Year 5	Excess bidder return	-0.36352***	0.03472 ns	-0.27096 ns

Table 6: Bidder results partitioned on book-to-market quintile. Figures show bootstrapped skewness adjusted t-statistic and excess returns. 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.

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

	Quintile/*no. obs in quintile*	**1**	***82***	**2**	***79***	**3**	***66***	**4**	***52***	**5**	***30***
Bootstrapped Skewness-adjusted t-statistics:											
Year	**Statistic**	Value	Sig. level	Value	Sig. level	Value	Sig. level	Value	Sig. level	Value	Sig. level
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
Pseudo Portfolio Sampling results:											
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

Panel 1B: Equity bidder results – size matched

	Quintile/*no. obs in quintile*	**1**	***82***	**2**	***79***	**3**	***66***	**4**	***52***	**5**	***30***
Bootstrapped Skewness-adjusted t-statistics:											
Year	**Statistic**	Value	Sig. level	Value	Sig. level	Value	Sig. level	Value	Sig. level	Value	Sig. level
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
Pseudo Portfolio Sampling results:											
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	-0.5977	***	-0.53569	***	-0.23169	*	-0.19317	ns	0.144676	ns

return

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

	Quintile/*no. obs in quintile*	**1**	***22***	**2**	***24***	**3**	***25***	**4**	***29***	**5**	***18***
Bootstrapped Skewness-adjusted t-statistics:											
Year	**Statistic**	Value	Sig. level	Value	Sig. level	Value	Sig. level	Value	Sig. level	Value	Sig. level
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
Pseudo Portfolio Sampling results:											
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

Panel 2B: Cash bidder results – size matched

	Quintile/*no. obs in quintile*	**1**	***22***	**2**	***24***	**3**	***25***	**4**	***29***	**5**	***18***
Bootstrapped Skewness-adjusted t-statistics:											
Year	**Statistic**	Value	Sig. level	Value	Sig. level	Value	Sig. level	Value	Sig. level	Value	Sig. level
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
Pseudo Portfolio Sampling results:											
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

Table 7: Bidder returns partitioned by hostility. Figures show bootstrapped skewness adjusted t-statistic and excess returns. 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.

Panel A: BTM and size-matched

	Classification/*no. obs in class*	Non-hostile	*372*	Hostile	*114*
Bootstrapped Skewness-adjusted t-statistics:					
Year	**Statistic**	Value	Sig. Level	Value	Sig. Level
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
Pseudo Portfolio Sampling results:					
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

Panel B: Size-matched

	Classification/*no. obs in class*	Non-hostile	*372*	Hostile	*114*
Bootstrapped Skewness-adjusted t-statistics:					
Year	**Statistic**	Value	Sig. Level	Value	Sig. Level
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	*
Pseudo Portfolio Sampling results:					
Year 1	Excess bidder return	-0.04858	***	0.002204	ns
Year 3	Excess bidder	-0.19475	***	-0.09447	ns

	return		
Year 5	Excess bidder return	-0.26498***	-0.22495 ns

Table 8: Bidder returns partitioned by hostility and form of financing. Figures show bootstrapped skewness adjusted t-statistic and excess returns. 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.

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	
Bootstrapped Skewness-adjusted t-statistics:									
Year	**Statistic**	Value	Sig. Level	Value	Sig. Level	Value	Sig. Level	Value	Sig. Level
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
Pseudo Portfolio Sampling results:									
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	*

Panel B: Size-matched

		Equity Non-hostile		Equity Hostile		Cash Non-hostile		Cash Hostile	
	Classification/no. obs in class	239		70		97		21	
Bootstrapped Skewness-adjusted t-statistics:									
Year	**Statistic**	Value	Sig. Level	Value	Sig. Level	Value	Sig. Level	Value	Sig. Level
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
Pseudo Portfolio Sampling results:									
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

Table 9. Fama-French 3 factor and Conditional Fama-French 3 factor models in calendar time: Full sample results. Independent variables for both models are as described in expressions (4) and (5) in the text respectively. The dependent variable is the 60-month calendar time excess return. T-statistics are in italics. Significance levels are denoted by * (10%), **(5%), and ***(1%) using two-tailed tests.

Panel A – unconditional results

VARIABLE	Overall	Equity	Cash	Non-hostile	Hostile
MKTXS	1.0605	1.0409	1.0716	1.0634	1.0677
	43.72	*30.54*	*31.48*	*39.04*	*35.36*
	***	***	***	***	***
SMB	0.63722	0.69601	0.44674	0.67398	0.46664
	11.64	*8.943*	*6.413*	*10.9*	*7.063*
	***	***	***	***	***
HML	6.63E-02	8.89E-02	4.65E-02	0.12951	-7.17E-02
	1.114	*1.264*	*0.6881*	*2.049*	*-1.005*
				**	
CONSTANT	-3.02E-03	-3.70E-03	-1.37E-03	-3.90E-03	3.58E-04
	-2.693	*-2.394*	*-0.9019*	*-2.917*	*0.2316*
	***	**		***	
R-SQUARE	0.8969	0.8062	0.8231	0.8531	0.8194

Panel B – conditional results

VARIABLE	Overall	Equity	Cash	Non-hostile	Hostile
MKTXS	0.97771	1.0076	0.85194	0.89797	1.1164
	7.395	*4.905*	*5.201*	*6.232*	*9.06*
	***	***	***	***	***
SMB	0.64692	0.70431	0.45378	0.68286	0.47994
	12.18	*9.187*	*6.577*	*11.34*	*7.552*
	***	***	***	***	***
HML	6.67E-02	9.12E-02	5.26E-02	0.13307	-8.12E-02
	1.154	*1.315*	*0.8063*	*2.162*	*-1.166*
				**	
TBRRM	-0.76427	-0.2799	0.43884	0.69861	-3.5257
	-0.4425	*-0.1259*	*0.2064*	*0.3523*	*-2.177*
					**
TERMRM	-5.0865	-5.5494	-3.7228	-3.9016	-7.5119
	-2.671	*-1.834*	*-1.345*	*-1.641*	*-2.927*
	***	*		*	***
DYRM	3.8342	1.6306	4.0082	2.2352	7.4117
	1.126	*0.3279*	*1.265*	*0.6084*	*2.054*
					**
CONSTANT	-2.90E-03	-3.42E-03	-1.31E-03	-3.68E-03	2.94E-04
	-2.703	*-2.305*	*-0.8581*	*-2.833*	*0.199*
	***	**		***	
R-SQUARE	0.904	0.8146	0.8289	0.8598	0.827

Table 10. Fama-French 3 factor and Conditional Fama-French 3 factor models in calendar time: Form of financing and hostility subset results. Dependent and independent variables for both models are as described in expressions (4) and (5) in the text respectively. The dependent variable is the 60-month calendar time excess return. T-statistics are in italics. Significance levels are denoted by * (10%), **(5%), and ***(1%) using two-tailed tests.

Panel A – unconditional results

Variable	Equity Non	Equity host	Cash non	cash host
MKTXS	1.051	1.0235	1.0628	1.1076
	25.51	*34.33*	*28.76*	*27.81*
	***	***	***	***
SMB	0.79957	0.43055	0.45484	0.43682
	9.065	*6.498*	*6.229*	*4.727*
	***	***	***	***
HML	0.17908	-2.03E-02	9.15E-02	-0.10117
	2.177	*-0.2704*	*1.213*	*-1.102*
	**			
CONSTANT	-4.37E-03	1.67E-04	-2.13E-03	3.24E-03
	-2.305	*0.1056*	*-1.316*	*1.432*
	**			
R-SQUARE	0.7474	0.8003	0.7962	0.6963

Panel B –conditional results

Variable	Equity Non	Equity host	Cash non	cash host
MKTXS	0.96366	0.9459	0.77903	1.2188
	3.642	*6.816*	*4.371*	*6.515*
	***	***	***	***
SMB	0.8081	0.42999	0.46107	0.44544
	9.272	*6.632*	*6.42*	*4.865*
	***	***	***	***
HML	0.18355	-1.27E-02	0.10163	-0.11425
	2.224	*-0.1842*	*1.394*	*-1.268*
	**			
TBRRM	0.5538	0.91052	1.4662	-4.0425
	0.1968	*0.4885*	*0.5968*	*-1.766*
			*	
TERMRM	-4.8963	-5.2692	-2.6702	-9.3161
	-1.353	*-2.305*	*-0.8796*	*-3*
		**	***	
DYRM	0.87895	-0.48089	3.0112	7.0954
	0.1452	*-0.1062*	*0.7769*	*1.71*
			*	
CONSTANT	-4.04E-03	4.92E-04	-2.01E-03	3.10E-03
	-2.176	*0.3212*	*-1.234*	*1.38*
	**			
R-SQUARE	0.7542	0.8094	0.8019	0.7041