# How far does financial reporting allow us to judge whether M&A activity is successful?

#### **Christina Dargenidou**

#### **Alan Gregory**

#### Shan Hua

#### April 2016

#### Xfi Centre for Finance & Investment

#### University of Exeter Business School

The authors gratefully acknowledge the support of the Institute Of Chartered Accountants in England and Wales in making this project possible. We are grateful to seminar participants at the ICAEW "Better Markets" Conference for some insights which we are able to reflect in the final version of this paper and would also like to thanks an anonymous reviewer and the editors for their helpful comments. Any errors or omissions remain the sole responsibility of the authors.

# How far does financial reporting allow us to judge whether M&A activity is successful?

#### Abstract

Evidence from share price returns suggests that acquisitions destroy value. On the other hand, evidence from accounting measures of performance suggests that acquisitions give rise to synergies and therefore potentially create value. In this paper, we first revisit the UK evidence using an updated sample, and confirm that these findings still hold, and importantly hold in the period following the introduction of FRS10. We then reconcile the (apparently conflicting) findings from these market-based and accounting-based approaches. Using accounting measures of performance, we confirm the presence of synergies developed during acquisitions. Finally we show that post-acquisition abnormal returns are associated with news of synergistic benefits conveyed in the financial statements.

# How far does financial reporting allow us to judge whether M&A activity is successful?

#### 1. Introduction

A consistent finding in the mergers and acquisitions (M&A) literature is that in the long term, acquisitions of listed targets destroy acquiring firm shareholder wealth. The effect is clear and unambiguous in the case of equity financed acquisitions, but rather more nuanced in the case of cash financed acquisitions (for a detailed review of this long run evidence, see Aggrawal and Jaffe, 2000). Exactly why this scale of shareholder destruction is found is the focus of several competing theories, including theories that suggest over-paying as a result of hubris (Roll 1986), that having too much financial slack is likely to result in managers pursuing their own interests rather than those of the shareholders (e.g. Seth et al., 2000), Jensen's (1988) free cash flow (FCF) hypothesis, and the behavioural timing hypothesis of Loughran and Ritter (2000). Shleifer and Vishny (2003) extend this market timing idea to suggest that firms make stock-financed acquisitions when their equity is highly valued, and in particular when it is more highly valued than the target's stock. By contrast, when the focus of attention becomes operating performance, there is evidence of improvements (Healy et al, 1992; Linn and Switzer, 2001; Powell and Stark, 2005) or at least, that the post-acquisition performance is a continuation of superior pre-acquisition performance (e.g., Ghosh, 2001).

At the time of writing, the financial press points to a combination of a weak economic environment, cheap financing and continued pressures from activist shareholders to boost returns leading to a recent global revival of the M&A activity back to pre-crisis levels.<sup>1</sup> Yet, at the same time, many remain sceptical about the recent deal making "euphoria" given past evidence of acquisitions rarely delivering what they purport to achieve.<sup>2</sup> Our aim is to contribute to this topical debate with reference to the UK, as a leading economy globally. As such, the objectives of this paper are first to update the UK studies discussed above, by taking our analysis through to the financial year ended December 2014. We examine both the long run (up to three years post takeover) stock-market performance of acquirers, and the long run (up to three financial years year post takeover) operating performance of acquirers. We then ask the question whether these performance estimates change following the introduction of FRS 10 in 1998. In theory,

<sup>&</sup>lt;sup>1</sup> "Global dealmaking breaks 2007 record", FT, December 21, 2015.

<sup>&</sup>lt;sup>2</sup> "M&As are under close scrutiny, and rightly so", FT, December 2, 2015; "Mergers and acquisitions boom driven by 'jumbo' deals", May 5, 2015

we could study the impact of various accounting changes on these performance metrics, but sample size rapidly becomes an issue when it comes to making meaningful comparisons. As such, we focus upon FRS 10 as, in effectively disallowing immediate goodwill write-offs and imposing the recognition of goodwill, it is the change that has the potential to make the most important difference to reported measures of performance.<sup>3</sup> Imposing the recognition of goodwill may also be expected to have a disciplining role on managers by forcing better acquisition decisions, which would in turn yield adequate returns on the underlying reported assets, including goodwill.<sup>4</sup> Furthermore, Gregory (2000) shows that goodwill write-off considerations (prior to the introduction of FRS10) appeared to influence the choice of financing method for the acquisition. Given the evidence that form of financing affects long run returns, we also investigate differences between cash and equity financed acquisitions. We also present evidence on how performance has varied through merger waves, and with the degree of diversification. Finally, we run tests to determine whether there is a relationship between post-merger accounting performance and long run market performance.

Our findings confirm that we should remain sceptical of the likely outcome at the time of M&A announcements. Drawing evidence from a long history of acquisitions in the UK (1985-2012) and a battery of tests on equity returns, overall we establish that acquisitions of UK listed plcs are associated with value destruction. When we examine the performance of acquisitions using financial statements' data, we note the presence of initial synergies that tend to decline over time. Moreover, our results suggest that accounting numbers reflect the underlying value creation, when this is achieved. Successful acquisitions characterised by positive post-acquisition abnormal returns also exhibit significant and persistent operating performance improvements, as opposed to value destroying deals where such operating performance improvement is not found. Further regression tests confirm an association between operating performance improvements and post-acquisition abnormal returns, controlling for acquirers' over-valuation and other bid

<sup>&</sup>lt;sup>3</sup> Prior to the FRS10 introduction and under SSAP22, the preferred treatment of goodwill was immediate write-off against reserves in the equity. For instance, Nobes (1992) shows that out of 300 cases reviewed for the financial year 1988-9, only 15 showed goodwill with the remaining 285 cases having goodwill immediately written off reserves or having no goodwill at all. FRS10 imposed the capitalisation of purchased goodwill and its subsequent amortisation. Capitalisation of goodwill is also compulsory under IFRS, introduced in 2005, with the difference that IFRS 3 prohibits the amortisation of goodwill.

<sup>&</sup>lt;sup>4</sup> Similarly to FRS10, IFRS3 imposes the recognition of goodwill. The two standards differ though in terms of their attitude towards the economic life of goodwill. Whilst our estimates of operating performance are not subject to the implications of discontinuing goodwill amortisation, we acknowledge that the differences between FRS10 and IFRS3 may have implications for the disciplining role of goodwill recognition. This is an interesting question for future research which will have access to an adequate sample to address this question.

characteristics. Whilst we present evidence attesting to the disciplinary effect of FRS10 in terms of improved operating performance, this effect is not necessarily translated into improved market performance. Our results have important policy implications for the recognition of goodwill. Given we show that roughly two thirds of M&A transactions destroy value, and further that these transactions show early signs of a lack of operating performance improvement, we would expect to see far more goodwill impairment charges than are actually observed. The clear implication is that the current regime for accounting for goodwill is anything but conservative.

#### 2. Literature review

#### 2.1 Long run market-based performance of acquirers and targets in the UK

Our interest in this paper is primarily in the long run performance of the acquiring firm. It is by now well established that markets react to M&A announcement in an anomalous fashion, on average under-reacting to the long run consequences of mergers. A full survey of the earlier literature can be found in Agrawal and Jaffe (2000), but all of Gregory (1997), Conn et al (2005) and Sudarsanam and Mahate (2003) confirm this for the UK. By contrast, Franks and Harris (1989) and Higson and Elliott (1998) find no significant abnormal returns by UK acquirers. One explanation for the conflicting results in the early studies is that none of them use the more sophisticated non-parametric testing methods advocated by Lyon et al (1999). This is important, as 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). However, one recent UK paper that does employ the event time methodology in Lyon et al (1999) finds significantly negative 3 year acquirer returns post merger in the case of equity bids, and insignificant negative returns in the case of cash bids (Bi and Gregory, 2011).

In the current study, in the spirit of Gregory (1997), we employ a range of approaches and benchmarks in an attempt to provide a robust answer to the question of abnormal returns postmerger. We provide evidence employing both event time and calendar time benchmarks. Both methods have their merits, but only the former permit the estimation of returns on a per case basis. This is essential if we wish to compare directly market-based outcomes with accountingbased outcomes. However, Fama (1998) argues 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, whilst Mitchell and Stafford (2000) argue that cross-dependency in event time returns is likely to be a problem. By contrast, Loughran and Ritter (2000) argue against the use of calendar time methods because of so-called "behavioural timing" considerations, since management has 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. Evidence in favour of such behavioural timing by acquirers can be found in Ang and Cheng (2006), Dong et al (2006) and for the UK in Bi and Gregory (2011). Additionally, there is evidence that UK firms manage earnings ahead of equity financed deals (Botsari and Meeks, 2008). In this paper, we follow Lyon et al (1999, p. 198), who note that both methods have advantages and disadvantages, and conclude that the "pragmatic solution" to the problem of analysing long-run abnormal returns is to use both event time and calendar time methods.

Our basic benchmarks for performance (in both event time and calendar time) come from forming reference portfolios. These consist of ten portfolios formed on the basis of size (market capitalisation) and 25 portfolios formed on size and book-to-market ratios. These portfolios are from the University of Exeter Xfi website and detailed description of the construction can be found there. All share returns and market capitalisation data are from the *London Business School Share Price Database (LSPD)*, whilst all book-to-market ratios are from *Datastream*. We measure event time abnormal returns using the Buy and Hold Abnormal Return (BHAR):

$$BHAR_{i\tau} = \left[\prod_{t=1}^{\tau} (1+R_{it})\right] - \left[\prod_{t=1}^{\tau} (1+R_{it}^{b})\right]$$
(1)

where  $\tau$  is the period of investment in months commencing at the start of the month of the acquisition,  $R_{it}$  is the return on security *i* in month *t*. The benchmark return,  $R_{it}^{b}$ , is the return on the size-matched or size and book to market matched control portfolios. 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).

For the calendar time returns, we employ the method described in Gregory et al (2010). This involves estimating a calendar time abnormal return relative to the same benchmark returns

described above, though additionally we employ the Fama-French model in calendar time. In general, we can summarise these calendar time approaches by letting  $R_{\tau,t}$  be a time series of a portfolio of returns on companies that made an acquisition within the previous  $\tau$  months. Calendar time tests effectively test for the significance of  $\alpha$  in a time series model

$$R_{\tau,t} = \alpha + (R_{\tau,t})^E + \varepsilon_t \tag{2}$$

where  $(R_{\tau,t})^E$  is the required return and  $\varepsilon_t$  is a zero mean disturbance term. This expected return can be from either a factor model (in our case, the Fama-French model) or a characteristicmatched benchmark,  $R_{bt}$ , of the form described above. Following Gregory et al (2010) and writing expected return as:

$$(R_{\tau,t})^{E} = R_{ft} + \beta (R_{bt} - R_{ft})$$
(3)

A simple CTAR is actually a special case with the additional restriction that  $\beta = 1$ . Lyon et al. (1999, p.197) emphasise that such simple CTAR methods appear to be better specified (and more conservative) than the Fama-French three factor approach, whilst Mitchell and Stafford (2000, p.321) also prefer the CTAR methodology rather than the Fama-French regression-based approach, noting that it suffers from fewer statistical flaws. However, against this, Ang and Zhang (2004) provide evidence in favour of the Fama-French model, but specifically advise against using the Carhart four factor model in tests. They also show that more powerful tests result from using weighted least squares (WLS) rather than ordinary least squares (OLS).

Given this debate, we report results from both CTAR models based on size and size plus book to market based benchmarks, and from the Fama-French model. Rather than restricting ourselves to the simple CTAR, (3) allows for some variation between the characteristics of the benchmark portfolio and the characteristics of the acquirer portfolio. Allowing such flexibility can be found in earlier papers<sup>5</sup>, but the innovation in Gregory et al (2010) is to exploit the advantage of the regression model to allow a more sophisticated approach to the problem of heteroscedasticity (Mitchell and Stafford, 2000) in calendar time portfolios. Whilst the simplest approach to the problem would involve the estimation of robust standard errors using White (1980) corrections, the approach in their paper is to use GLS, which involves estimating the variance of the portfolio.

<sup>&</sup>lt;sup>5</sup> For example, it is used in a study of UK IPOs by Espenlaub, Gregory and Tonks (2000).

As in Gregory et al (2010), when computing BHAR and calendar time returns, de-listed firms were treated on the following basis. If a de-listed firm has preserved its value (such as a merger or an acquisition), we replace the return of that firm by the return of the benchmark. If the delisting is due to a total loss of value (liquidation/bankruptcy), we replace the return by -1. In making this distinction, we use the LSPD G10 description.

In order to assess the pre-bid market performance of acquirer and target, we also report their BHAR returns for the 36 months pre-merger.

#### 2.2 Value creation in acquisitions: evidence from operating performance tests

#### 2.2.1 Operating performance synergy

A significant part of the M&A literature seeks evidence of value creation in terms of firms' fundamentals. Following the seminal papers of Ravenscraft and Scherer (1989) and Healy *et al.* (1992), this approach relies on cash flow measures of performance as a proxy for the actual economic benefits generated by the combined assets of the target and the acquirer. Value creation arising from acquisitions is then evaluated across two dimensions. First, by means of the assessment of the combined acquirer's and target's performance relative to the performance of similar firms. Second, by means of the comparison between the post-acquisition and pre-acquisition adjusted performance of the combined firms. Evidence of value creation or synergy is then inferred on the basis of the improvement in the combined firms' adjusted performance post-acquisition.

Prior research estimates operating performance synergy under two different underlying assumptions. Assuming that the combined acquirer's and target's pre-acquisition adjusted performance will persist in the future in full, synergy may be estimated as the simple change between post-acquisition and pre-acquisition adjusted performance (henceforth, the "change" model).

#### *Synergy* = *Post-acquisition adjusted performance* – *Pre-acquisition adjusted performance*

(4)

From another perspective, the combined acquirer's and target's pre-acquisition adjusted performance is subject to competition pressure and mean-reverting. Accommodating mean reversion calls for a regression based model (henceforth, the "intercept" model) whereby synergy is estimated by the intercept of the model presented in equation (5):

In the intercept model, synergy is estimated as the average improvement in adjusted performance for the sample of acquisitions in the test, after controlling for the persistence of the preacquisition adjusted performance, denoted here by  $\beta$ . Typically,  $\beta$  takes values that are less than one, reflecting the reversion to the mean of the combined firms' adjusted performance. When  $\beta$ is constrained to be equal to one, i.e., there is no reversion to the mean, the intercept model corresponds to the change model in (4).<sup>6</sup>

A particularly clear exposition of the methodological approach, complete with examples, can be found in Manson, Stark and Thomas (1994, Ch. 2).

#### 2.2.2 Deflators

Empirical evidence using the change or the intercept model has yet to arrive at a consensus over whether synergies have been obtained. A summary of the findings reported in prior research is presented in Table 1. An obvious reason for the inconsistency among prior research estimates is the sensitivity to the measures of operating performance employed. For instance, as shown in Table 1, there is considerable variation over the deflator to the cash flow variable, which is (typically defined as pre-depreciation and amortisation operating profit. Following Healy et al. (1992) prior research (e.g., Powell and Stark, 2005; Ghosh, 2001; Carline, Linn and Yadav, 2009; Linn and Swizer, 2001) employs an approximation of the market value of assets (MVA) as a deflator, estimated as the market value of equity plus debt and preferred equity. On the one hand, a market value measure of assets is not subject to accounting policy choice or accounting regulation and may be a representation of the opportunity cost of those assets (Healy et al., 1992). To some extent, prior research using MVA as a deflator confirms the initial Healy et al. (1992) findings by providing overall evidence of positive synergies. However, the advantages of this approach can be outweighed by the fact that market values also reflect the expected future benefits from assets in place. More important, given the evidence of post-acquisition negative share price returns, this deflator may lead to rather inflated estimates of synergy, if opening market values each year were to be employed. One can get around the former problem by adjusting market values by the announcement period returns (an approach followed in Healy et

(5)

<sup>&</sup>lt;sup>6</sup> Similar methodologies are also employed to examine the implications of divestiture on operating performance (e.g., Gadad, Stark and Thomas, 2009; Desai and Jain, 1999).

al, 1992 and Powell and Stark, 2005), but the latter issue remains a concern, and is discussed in Ghosh (2001) as well as Powell and Stark, (2005).<sup>7</sup>

A common alternative deflator in prior research (e.g., Martynova et al., 2007; Powell and Stark, 2005; Harford et al., 2012; Sharma and Ho, 2002) is the book value of assets (BVA). Whilst this measure is not subject to the drawbacks of MVA, it is not without disadvantages either, mainly because of the effect of goodwill. Powell and Stark (2005) argue that goodwill should not be taken into account when measuring improvements in operating performance. On the other hand, insofar goodwill is an asset, and thus expected to generate benefits for the firm, performance evaluation should take goodwill into account. Moreover, a performance indicator using BVA as a deflator may also convey the extent to which goodwill has contributed to value creation. A possible implication of the inclusion of goodwill in the asset base is a temporary decline in the performance indicator as long as a long integration process delays the manifestation of synergy on the firm's fundamentals. As can be seen in Table 1, prior research using ratios deflated by the book value of assets (BVA) provides mixed evidence of significant positive and negative synergies. This is in some contrast to the evidence using alternative deflators and may indicate that goodwill has an effect on observed performance. In this paper, we investigate this issue further taking by partitioning the sample around the introduction of FRS10 in the UK.

Finally, a third commonly used deflator is sales (Martynova *et al.*, 2007; Powell and Stark, 2005; Ghosh, 2001; Sharma and Ho, 2002;Healy *et al.*, 1992). Sales could be considered as a deflator which overcomes the problems of both the market value of assets (MVA) or the book value of assets (BVA) and specifically, the influence of goodwill on the asset base of the combined firm. However, cash flow divided by sales is no longer a performance indicator but instead, a margin. From the perspective of a Dupont type decomposition, the cash flow margin captures only one aspect of operating performance with the second aspect being captured by asset turnover. Insofar as synergies could be led by efficiency improvements rather than improvements in margins, the use of this measure may be misleading. For instance, the results in Healy *et al.* (1992) suggest that evidence of operating performance synergy is driven by an efficiency improvement rather than an improvement in margin which is statistically insignificant. Nevertheless, and to the extent

<sup>&</sup>lt;sup>7</sup> That said, conceptually one could use the market value *before* merger announcement as a constant deflator, and so avoid the annual update issue.

we could judge from the prior research findings reported in Table 1, operating margin indicators tend to confirm the evidence provided by alternative measures.

#### 2.2.3 Benchmarks

Following Healy et al. (1992), prior research employs an industry average, typically an industrywide median as a proxy for the expected operating performance or benchmark. More recent studies acknowledge the arguments in Barber and Lyon (1996), who point out the implications of mean reversion in accounting measures of performance for the choice of an appropriate benchmark. Ghosh (2001) argues that this point is especially pertinent in the context of acquisitions, given that merging firms tend to undertake acquisitions following a period of superior performance. Thus, a non-random measurement error will be absorbed in the intercept of the regression which will bias conclusions about merging firms' post-acquisition performance. To overcome this issue, those studies advise matching sample firms to control firms that are selected on the basis of industry, pre-merger performance and size. Although this view is theoretically consistent, in practice the task to pick the correct matching firms for the benchmark can become challenging (Martynova et al., 2007) and inference may be subject to the compromises that a researcher makes in this process. Notably, as shown in Table 1, the findings of Ghosh (2001) show that the differences between synergies estimated using an industry adjustment and synergies using a set of matched firms as a control are not material when the change model is employed. Moreover, as shown in Table 1, both Powell and Stark (2005) and Martynova et al (2007) find that the size of the estimated performance improvement is higher when the benchmark consists of matched firms in terms of industry, size and pre-performance, which contradicts the arguments in Ghosh (2001).

Overall, the findings reported in Table 1 do not suggest that the use of an industry median or the use of matching firms as a control makes a notable difference in the overall inference on synergy.

#### 2.2.4 Change model versus intercept model

The most interesting point that arises from the figures reported in Table 1 is that evidence on synergy is almost always stronger under the intercept model rather than the change model. According to Ghosh (2001), when the difference between the combined firms and the benchmark employed is driven by permanent effects, the intercept model tends to yield inference on synergy which is biased upwards whilst the change model will yield unbiased estimates indicating the lack of synergy. This prediction appears to hold in most cases of the findings reviewed in Table

1.<sup>8</sup> Moreover, an inspection of the patterns of adjusted operating performance indicators reported by prior research, as shown in Table 2, demonstrate a regularity of superior (i.e., greater than the benchmark) pre-acquisition performance followed by a superior post-acquisition performance. Those statistics appear to confirm Ghosh (2001)'s prediction about the source of bias in the intercept model.

We note that evidence from the change (and the intercept) model relies on summarised measures of performance (means or medians) over a long window of observation. A closer inspection of the patterns in performance indicators in Table 2 reveals a mix of patterns and interesting dynamics taking place within the post-acquisition period. More worryingly, there is a pattern of decline of post-acquisition decline in operating performance (Powell and Stark, 2005<sup>9</sup>; Harford *et al.*, 2012; Ghosh, 2001), especially among studies whose sample covers a relatively longer period of time. Notably, this pattern is recurring with respect to the adjusted CF/Sales indicators whilst this is less pronounced among the adjusted CF/BVA indicators. This evidence casts doubts on Ghosh's (2001) assertion over the continuation of pre-acquisition performance into the post-acquisition period and implies the possible presence of transitory effects in addition to permanent effects in those measures. Under those circumstances, neither the intercept nor the change model could yield reliable estimates of the operating performance improvements attributed to the acquisition.

Overall, prior research presents rather mixed evidence with respect to the operating performance improvements attributed to acquisitions. Nevertheless, given the overview presented in Table 1, we cannot dismiss entirely the idea that financial reporting information indicates that synergies are created. This is rather puzzling given the established evidence of value destruction from share returns. In the present study, we shall attempt to shed further light on this issue.

#### 3. Data and sample

The sample size is constrained by the need to have both the necessary accounting data and market returns data, with the size varying very slightly according to the specific criteria used. Our set

<sup>&</sup>lt;sup>8</sup> The prior research findings reported in Table 1 imply that the use of the change model rather than the use of a benchmark using matched observations addresses the bias in the estimation of operating performance synergy discussed in Ghosh (2001).

<sup>&</sup>lt;sup>9</sup> The Powell and Stark (2005) study is important here since it also examines UK firms. We note also another earlier study based on UK firms, Manson, Powell, Stark and Thomas (2000) which is based on a smaller sample.

of mergers starts in January 1985 and ends in September 2012 (30th September being the cut-off date for the size and book to market control portfolios on the Xfi website). For each merger, we need to be able to calculate operating performance for the target and acquirer pre-merger, and the acquirer ("combined firm") post-merger. This is a rather demanding information requirement, and so out of the set of potential acquisitions, there are 417 acquisitions that have the necessary data to allow us to calculate operating performance for one year pre and postmerger, together with BHARs. We base our main performance tests on the one year pre and postmerger operating performance because the sample size falls as we lengthen the window. Of course, the requirement that we can observe operating performance for even one year post merger necessarily involves an element of survivorship bias, as by definition the combined entity has to survive for long enough to produce at least one set of post-merger financial statements. As we expand the operating performance window, we need extra years of financial statements premerger for both acquirer and target, combined with extra years post-merger. The effect is that the sample size falls to 295 for three year operating performance comparisons. Note, though, that these additional survival criteria do not affect the market-based performance measures because of the de-listing returns treatment we describe above.

Our merger information is drawn from several sources. Our principal source is Thomson One, but we supplement this with sample information from Bi and Gregory (2011) which in turn draws on some of the sample information from Gregory (1997). Our accounting information is drawn from Worldscope, but is supplemented by archived Datastream information, for the provision of which we are extremely grateful to Ian Tonks of Bath University. Our returns and market capitalisation information is from the LSPD, and the control portfolio and Fama-French factor returns are from the University of Exeter Xfi Website.

To be included in our sample, both acquirer and target must be quoted UK companies, the bid needs to have been successful (defined as the bid needing to have been completed with the percentage of the target owned after acquisition being more than 50%). To ensure the target is a material acquisition, we follow the criteria in Heron and Lie (2002) and require that the target sales and total assets must be at least 1% of those of the acquirer. As the accounting measures that we employ require a consistent interpretation across industries, as is conventional we drop financial industry acquirers and targets from our sample. Finally, we drop all those firms where we cannot identify returns, market values or the required accounting variables or identify the industry membership of acquirer and target. We follow Powell and Stark (2005) in defining industry membership in terms of Datastream Level 4 classifications. This results in an initial

sample of 417 deals for which we can compute pre bid and post bid returns, together with operating performance for the financial year pre and post bid. Summary data on size and returns for this sample is reported in Table 3, Panel A.

As explained above, analysing the operating performance over the longer term (three years pre and post bid) imposes an additional survivorship criterion, and so in the section where we examine the *long* term operating performance, we are left with a sample of 295 firms.<sup>10</sup> Summary data for this sub-sample in reported in Table 3, Panel B.

Given the *City Code* requires cash alternatives under some conditions, we classify cash bids as those made entirely for cash or cash with a loan note alternative (see Gregory, 1997 and Gregory, 2000 for a discussion). The remaining bids, which involve equity financing, we refer to as "stock-financed" or "equity" deals.

#### 4. Empirical results

#### 4.1 Market-based performance

#### 4.1.1 Pre-bid returns

We start by presenting the pre-bid returns for acquirers and targets in Table 4. Looking at the "Overall" results, it is clear that acquirers are outperformers in each of the three years pretakeover, no matter which benchmark or test statistic is used, although the 24 month pre-bid return is only weakly significant using the size and book-to-market matched control. The scale of this out-performance is striking at between 38.7% and 42.9% over the three years depending on the benchmark employed. For targets, the effect is more nuanced. Targets have significantly under-performed over the two years pre-acquisition, with the effect around 11% to 12% in round numbers. However, targets do not significantly under-perform in the year prior to the month of acquisition, although of course any run-up in stock price in anticipation of a bid will affect these results.

What is particularly striking is the difference in performance between cash and equity financing acquirers. Those that finance their acquisitions with cash have a tendency to have been outperformers, but the results are not robustly significant. However, these acquirers buy targets with a two year underperformance of around 18% to 19%. By contrast, stock-financing acquirers

<sup>&</sup>lt;sup>10</sup> Note that it further imposes the requirement that both target and acquirer existed for three years pre the merger, but this is observable at the time of the bid, and so does not amount to a survivorship bias.

are strong out-performers over each of the three years pre-bid. Yet there is no evidence to suggest that these acquirers are buying targets that have performed differently from their benchmarks. The evidence here is, *prima facie*, supportive of the Shleifer-Vishny (2003) hypothesis that suggests highly-valued firms will use their stock to buy less highly valued targets. By contrast, cash acquirers simply seek out "cheap" targets. We do not investigate this issue further in this paper, as Bi and Gregory (2011) directly investigate the hypothesis in the UK using valuation metrics, finding support for it. Instead, we simply note that the evidence here is consistent with their results.

#### 4.1.2 Post bid returns

The results for the post bid return analysis of BHARs can be found in Table 5. The precise interpretation of the long run post bid returns is benchmark and test-metric specific in the shorter term, but the three year post bid outcomes are unambiguous, with the average acquisition destroying shareholder value. The effect ranges between -16.6% and -19.8%. There is some evidence that performance deterioration starts in the first year post merger, but it appears to become stronger in the second year. Note that this is not a complete sample of acquirers but has some hindsight bias insofar as the acquirer must have survived as an independent entity for one financial year post acquisition. As we note above, this is required for us to make any observations on the subsequent operating performance.

As would be expected given the results from previous studies, the shareholder losses to equityfinancing acquirers are far greater than those to cash-financing acquirers. There is some weak evidence of modest under-performance amongst cash acquirers but it is not robustly significant. Looking at the stock financing acquirers, we see that there is some evidence of negative returns during the first year, but the effect becomes far more pronounced and significant during the second and third years post acquisition, with negative returns of between -14.1% to -17.4% in the second year, becoming -21.9% to -26.3% in the third year.

Finally, we partition our sample into pre and post FRS10 periods. Our expectation would be that matters improve post the introduction of FRS10, partly because of the "disciplining" effect of no longer being able to write-off goodwill to reserves, partly because there is some evidence that this ability influenced the propensity to issue stock (Gregory, 2000) and partly for the simple reason that one might expect market participants to learn from the gradual and persistent accumulation of the evidence on the poor post-acquisition performance of acquirers. However,

the results in the bottom two panels of Table 5 provide no evidence to back this expectation, although the actual outcomes are metric-dependent.<sup>11</sup>

We note in all of these results that, in contrast to some earlier UK studies, the sub-analyses sometimes exhibit weak significance levels. Closer inspection suggests that it is the employment of bootstrapped skewness adjusted t-statistics that are driving this sensitivity. If we use a conventional t-test (which, of course, papers pre Lyon et al 1999 would generally have done), significance levels are far stronger. In general, these t-tests have values that are often double the bootstrapped value, and we note that the non-parametric pseudo-portfolio p-values exhibit much higher significance levels than the bootstrapped skewness adjusted t-tests. Of course, if we want to measure individual firm outcomes (which we need for our later tests in this paper), we are left with no reasonable alternative<sup>12</sup> but to use BHARs. However, when the objective is to draw broad-brush conclusions on categories of acquirer, we can use the alternative of calendar time methods, and it is these to which we shortly turn. However, before doing so we briefly discuss three further aspects of these results.

First, it may be the case that returns vary through so-called "merger waves" (as suggested by Martynova and Renneboog, 2008) or that other features of the economic environment (such as the financial crisis) have a major impact on the average returns. Figure 1 shows how the size-adjusted BHARs vary through time. We show both mean and median BHARs for each year, and outline the "merger wave" periods suggested by Martynova and Renneboog (2008). We are, of course, missing the early years of the 1981-7 wave but there seems to be no obvious evidence of long run returns varying through the cycle in any systematic way, and although the first year of the 1993-2000 wave shows the highest returns in the wave, the first year of the 2003-6 wave shows the lowest. Second, we enquire whether these results are driven by a few outliers, as suggested may be the case by Moeller, Schingeman and Stulz (2005). If this was indeed the case in the UK, then we would expect the median BHARs to be greater than the mean BHARs, and the number of "winners" (those with positive BHARs) to outnumber the "losers". Third, in the spirit of Healy, Palepu and Ruback (1997), we examine whether acquisition performance depends on whether the target is in the same industry as the acquirer.<sup>13</sup>

<sup>&</sup>lt;sup>11</sup> Simple t-tests on the BHARs show no evidence of statistically significant differences.

<sup>&</sup>lt;sup>12</sup> We take it as axiomatic that we would not want to use an indicator with known biases such as CAR.

<sup>&</sup>lt;sup>13</sup> Note that they actually refer to "strategic" acquisitions and describe the characteristics of such deals as "friendly transactions that typically involved stock payment for firms in overlapping businesses". We do not observe bid hostility in this sample but we are able to observe both relatedness and financing.

Table 6 then reports returns by periodicity, using the Martynova and Renneboog (2008) wave and non-wave periods, and by degree of relatedness, splitting the sample between cash and equity financed acquisitions in each case. First, we note that overall the medians are more negative than the means, and the percentage of winners is only 34%. This general trend is true for the cash sample, where the winner percentage is 42%, and also for the share sample, where the winner percentage is 29%<sup>14</sup>. So there is absolutely nothing here to support the Moeller et al (2005) suggestion that a few "bad apples" mean that the overall averages give a misleading impression of merger outcomes. If anything, the UK evidence is indicative of a small number of good outcomes lifting the overall average, rather than reducing it. Second, we can observe trends through time. There is some evidence that the percentage of equity-financed deals is higher during merger waves. Quite what one concludes on returns through time depends on whether medians or means are referred to, or whether we are interested in the proportion of winners, but the post crisis period appears to have some of the least poor outcomes in terms of the scale of the returns (though not in terms of the percentage of winners). However, the small number of mergers in this period makes it hard to draw any statistically meaningful conclusions. Somewhat more intriguingly, cash acquirers seem to do better in merger wave periods than in non-merger wave periods, and this difference is statistically significant using a simple t-test. No such difference emerges in the share financed acquisitions however.

At first glance, the differences between related and unrelated acquisitions seem unremarkable. There is a hint that related mergers perform better, but the difference is not statistically significant. However, we get a striking result when we separate bids according to the form of financing. Cash financed related acquisitions show a positive performance overall (5% mean BHAR; 2.9% median BHAR) with fractionally over half the sample being "winners". The small number of bids means that overall this is not statistically significantly different from zero, but the *difference* in performance between related and unrelated cash acquisitions is significant (using a conventional t-test). Unrelated cash acquisitions fare badly, with post bid returns of -23.8%. Neither do medians or winner percentages support any notion of this result being driven by a few bad acquisitions. The contrast with equity financed acquisitions is interesting. Here, unrelated acquisitions do marginally better, whether we measure outcomes by means, medians or percentages of winners.

<sup>&</sup>lt;sup>14</sup> These winner percentages are slightly higher if BHARs are defined using size and book to market matched portfolios, but the point about medians being more negative than the means remains.

Turning next to the calendar time results, reported in Table 7, we see that these returns exhibit stronger significance levels than the event time results. Overall, the 12, 24 and 36 month abnormal returns are significantly negative compared to the benchmark, and the scale of the alphas is consistent with the BHARs. When we study the cash and equity sub-samples, the clear implication of the calendar time results is that cash acquirers consistently under-perform under all benchmarks over two to three years post acquisition. Further, the scale of under-performance seems somewhat higher than that implied by the BHAR analysis. One explanation is that the regression tests imply that the (unreported) betas of the calendar time portfolios are modestly higher (1.06 to 1.08 depending on the model) than the unity assumed in the BHAR method, implying they have slightly greater systematic risk than the benchmark. Equity acquirers show substantial under-performance, with the scale of that being a little greater than implied by the BHAR results.

The calendar time returns shed a somewhat different light on the pre and post FRS10 results. In calendar time, the pre FRS10 results are unambiguously negative from 24 months onwards. However, the 24 month post FRS 10 results are not as statistically robust as the BHAR analysis implies. Nonetheless, after 36 months the returns are strongly negative, and there is nothing that suggests an improvement after the introduction of the standard.

To sum up, the weight of the evidence shows that acquisitions of listed UK firms are, on average, shareholder wealth reducing events in the longer term, and there is no evidence to suggest any significant change in this outcome following the introduction of FRS 10. It is clear that equity-financed acquisitions are the source of a major reduction in shareholder wealth over the three years following the merger, with a reduction in wealth of anything up to around a quarter or more on average, depending on the precise metric used, though as a minimum the reduction is well over 20%. However, we note that consistent with the Shleifer-Vishny (2003) hypothesis, stock-financing acquirers have out-performed in the run-up to the acquisition, and there is at least some evidence to suggest that UK firms may be using over-valued (or at least fully valued) stock to buy targets that command a lower valuation (Bi and Gregory, 2011). Given this evidence, it is possible that equity value would have fallen if an acquisition had not been made. Last, when it comes to cash acquisitions, the evidence is nuanced. What we can say with confidence is that on average these do not add to shareholder value. Whether they too destroy value is more ambiguous. There is some evidence that they do, though the scale of wealth destruction is considerably smaller than for stock financed deals. However, this finding is dependent on the

model and methodology used to compute abnormal returns, with the strong evidence for underperformance being confined to calendar time based metrics.

Having comprehensively analysed market-based measures of performance, we now turn to an analysis of operating performance.

#### 4.2 The evidence on operating performance

#### 4.2.1 Patterns of adjusted operating performance

We concentrate on the three-year adjusted operating performance of 295 pairs of acquirers and targets in the UK. Following prior research, the operating performance is estimated as operating profit before depreciation and amortisation<sup>15</sup> scaled by total assets at the beginning of the financial year. Additionally, we also deflate this measure of operating cash flow by sales (this is also the cash flow margin). In the present study, cash flow margins are considered as an alternative measure of performance which is not affected by accounting for goodwill. However, we acknowledge that the interpretation of this ratio is limited to measuring the firm's ability to control the costs incurred to generate sales rather than measuring overall performance with respect to the assets employed. These operating performance measures are then evaluated against an industry benchmark to give an industry adjusted measure of operating performance during three years preceding and three years following the acquisition. We exclude the year of the acquisition since the effect of the acquisition on the consolidated reported performance at that time is not complete. We start with a broad brush overview of industry-adjusted performance and how it relates to the industry benchmark before moving to a more detailed statistical analysis of synergy in the next section.

The figures reported in Table 8 for the overall sample demonstrate that the combined firms' adjusted operating performance is positive throughout the period surrounding the acquisition. This is in line with the findings of prior research in the UK and elsewhere. It is also consistent with the continuation of the combined firms' superior performance into the post-acquisition period. However, a closer inspection of the patterns reported here reveals that the post-

<sup>&</sup>lt;sup>15</sup> Whilst Worldscope provides information on the total depreciation and amortisation expense, the archived Datastream data that we use for the pre-2005 estimation of operating performance report depreciation expense (item 136) only. For this period, we add the depreciation expense item (136) to the amortisation of intangibles item (975) in order to arrive to operating profit before depreciation and amortisation.

acquisition superior performance is driven by a rather regular pattern of an initial short-term improvement which decays in the subsequent years. Similarities with this decaying pattern can also be identified in Powell and Stark's (2005) findings for the UK, and in Harford *et al.* (2012) for the U.S.A. We note, though, that our data cover a considerably lengthier period of time (28 years) as opposed to the typically shorter periods covered in prior research, allowing us to examine performance over several cycles. This point is pertinent insofar M&A activity is clustered around changing industry circumstances (Mitchell and Mulherin, 1996; Andrade et al.,2001; Andrade and Stafford, 2004).

In our sample, the decay of any initial short term improvement mirrors the benchmark's operating performance decline during the post-acquisition period. This trend is in sharp contrast to the steady or even rising performance of the benchmark during the pre-acquisition period. This is illustrated in Figure 2, Panel A, which demonstrates the benchmark's medians of CF/BVA, and Panel B which demonstrates the benchmark's medians of CF/Sales around the acquisition event. The benchmark trends imply that acquisitions tend to occur around the peak of industry performance. Furthermore, the patterns reported here reveal that this particular timing may have implications for the dynamics of the post-acquisition performance. This could suggest an interesting avenue for further investigation of the value creation process and synergy in acquisitions.

Partitioning the sample into cash and stock-financed acquisitions, stock-financed acquisitions appear to exhibit a stronger initial improvement of performance (in terms of adjusted CF/BVA and CF/Sales) as well as a stronger decay afterwards. This is illustrated most clearly with reference to the adjusted CF/Sales measure, reported in Table 8, Panel B whereby stock acquisitions' industry-adjusted margins almost double from 1.69% at the year before the acquisition to 3.24% at the year following the acquisition, to revert again to pre-acquisition levels. By contrast, the industry-adjusted margins of cash acquisitions exhibit a less pronounced initial improvement in terms of margins, from 1.67% in the year before the acquisition to 2.39% in the first year after the acquisition. However, margins for cash acquisitions are quite persistent during the post-acquisition period (specifically, the industry-adjusted margins actually rise slightly, to 2.78% in year t+2 falling back to 2.47% in year t+3, whereas those is stock-financed acquisitions tail off to 2.03% in year 2 and 1.84% in year t+3.

We next partition of our sample based on whether FRS10 applies to the post-acquisition period financial statements. In our sample, the average growth in the book value of assets of the

combined firms from the year preceding the acquisition (t-1) to the year following the acquisition (t+1) in the pre-FRS10 period is 25.9% while in the post-FRS10 period the corresponding growth is 40.7%, with this difference being statistically significant (at the 5% level). A reasonable assumption is that the more pronounced growth in the book value of assets in the post-FRS10 period reflects the impact of capitalising goodwill. Despite this, the patterns of industry-adjusted operating performance (CF/BVA) do not support any obvious impact of goodwill capitalisation. An examination of the CF/BVA patterns reported in Table 8, Panel A reveals that during the post-FRS10 period, this measure increases from 1.04% in the year preceding the acquisition (t-1) to 2.13% in the year following the acquisition (t+1). Whilst this is consistent with the values in the pre-FRS10 period (1.11% in the year preceding the acquisition to 1.58% in the year following the acquisition), the implication is that despite the effects of goodwill capitalisation, operating performance actually improves in the post FRS10 period. We note that in the post-FRS10 period, acquisitions tend to result to a substantial increase in cash flow margins. Specifically, in Table 8, Panel B we show that the industry-adjusted cash flow margins in the post-FRS10 period increase form 1.48% to 4.36% between year t-1 and year t+1, while the corresponding industry-adjusted margins in the pre-FRS10 period are 1.70% and 2.26%. As cash flow margins are not affected by accounting for goodwill, the post-FRS10 period seems to be characterised by, at least initially, more profitable acquisitions, though in both periods synergies tail off over the next two years.

A major objective of this paper is to examine the relationship between post-acquisition operating performance and the evidence on long-run returns. To shed further light on this intuition, we partition the sample on the sign of our estimated abnormal returns over 36 months, using the ten size portfolios benchmark.<sup>16</sup> We refer to the cases which exhibit positive abnormal returns over the 36 months as "winners" and the remaining cases as "losers". The results are shown in Table 8, where we see that the "winners" exhibit a more pronounced initial improvement in their industry-adjusted operating performance (CF/BVA) with the magnitude of this metric climbing to 3.10% from 1.76%. The corresponding adjusted CF/BVA for "losers" exhibits a smaller rise to 1.34% from 0.60%. More importantly, the comparison of the post-acquisition patterns between "winners" and "losers" suggests that value creation is linked to the persistence of the initial synergy amongst the winner group, where superior performance persists at higher levels than the pre-acquisition performance level. By contrast, we observe a much faster decay

<sup>&</sup>lt;sup>16</sup> Results relying on the sign of abnormal returns based on 25 size and book to market portfolios benchmark are qualitatively similar and so we do not report them for space reasons.

amongst the loser group, with virtually zero out-performance of the benchmark remaining after three years. Broadly similar inferences can be also drawn from the adjusted cash flow margins (Table 8, Panel B), where the winner group actually shows some increase in industry-adjusted margin over the three years, whereas the loser group metric falls to less than half the year t+1 value. Finally, there is little obvious difference in patterns between related and unrelated acquisitions.

#### 4.2.2 Operating performance synergies

The observation of operating performance patterns in our sample leads us to the intuition that value creation relies first on the initial improvement in operating performance that occurs following the acquisition and second, on the persistence of this initial improvement over the post-acquisition period. The evidence on operating performance synergy in prior research does not discriminate between those two stages. In this paper, we aim to provide further evidence on the importance of considering both the initial improvement in performance and second, its persistence by adopting different windows of observation in the assessment of synergy.

Following prior research, we estimate operating performance synergies based on the two prevalent models in the literature, the "intercept" and the "change" model. The estimates of synergy reported on Table 9, Panel A consist of the intercept of a regression<sup>17</sup> of the post-acquisition on the pre-acquisition median adjusted performance in terms of CF/BVA (the "intercept model") and a simple model of the difference between those variables (the "change model"). Panel B presents the corresponding estimates using the adjusted CF/Sales as an alternative measure of performance. The change model synergy estimates are calculated as the median of the difference between the paired measures of post and pre-acquisition adjusted performance and the statistical significance is assessed by means of a Wilcoxon signed rank test.<sup>18</sup> Overall, the intercept model tends to yield evidence of positive and significant synergies in our sample and across most of its partitions. On the other hand, the change model yields more conservative estimates of synergy in terms of both magnitude and statistical significance. We interpret this difference as the result of the bias in inference discussed by Ghosh (2001). To put

<sup>&</sup>lt;sup>17</sup> The regressions are estimated by OLS allowing for robust standard errors.

 $<sup>^{18}</sup>$  The median of the difference between two numbers is not necessarily the same as the difference of medians. This issue is pertinent when assessing the patterns of the change between the operating performance medians in (t-1) and (t+1) and the estimates of the change model for the same window, as reported here.

that simply, the discrepancy between the intercept and the change model is most likely attributed to permanent factors in the pre-acquisition performance of the combined firms which bias the intercept estimate upwards whilst the change model estimates would suggest otherwise.<sup>19</sup> This is also a pervasive feature of the findings in prior research as reported in Table 1. Consequently, although we report the results from the intercept model for comparative purposes, we discuss the results reported in Table 8 with reference to the change model.

Whilst prior research relies on the comparison of the average (typically, the median) adjusted operating performance before and after the acquisition, we supplement those tests by an assessment of the initial change in adjusted operating performance between the years preceding and following the acquisition year (t-1 to t+1). We further seek evidence on the persistence of the initial improvement in adjusted operating performance by extending the window of observation to three years following the acquisition (t+1 to t+3). That is, we compare the median adjusted operating performance over (t+1 to t+3). Finally, following prior research, we compare the median performance over the three years preceding the acquisitions (t-3 to t-1) to the median performance over the three years following the acquisition (t+1 to t+3).

The deterioration of the combined firms' performance following the acquisition can be seen clearly in the unpartitioned sample in Table 9 Panel A. There is evidence of an initial improvement in adjusted performance in terms of adjusted CF/BVA (0.56%, significant at 5%), but this is not maintained when the window of observation is extended over the longer post-acquisition period. On the other hand, there is statistically significant evidence of synergy in terms of the adjusted CF/Sales, reported in Table 9 Panel B, across all windows of observation.

Stock-financed acquisitions also exhibit an initial improvement in operating performance based on either adjusted CF/BVA (0.68%, significant at 5%) or CF/Sales (0.52%, significant at 5%). This initial synergy is not sustained across longer windows. On the other hand, cash acquisitions exhibit different patterns, where the overall lack of evidence on synergy in terms of adjusted CF/BVA is contradicted by findings which point to persistent and increasing synergy in terms of

<sup>&</sup>lt;sup>19</sup> In effect, this gives rise to the classic "errors-in-variables" problem discussed in standard econometric texts. If the pre-bid adjusted performance in (5) is measured with error,  $\beta$  is biased downwards and the intercept is biased upwards.

adjusted CF/Sales.<sup>20</sup> Nevertheless, the differences that we identify here with respect to the cash and stock acquisitions are not statistically significant as indicated by a Mann-Whitney test.

Turning to the implications of imposing the recognition of goodwill, introduced by FRS10, we find evidence that points to a disciplining effect. More specifically, with regard to the CF/BVA metric, there is only very weak evidence of synergy with respect to post-FRS10 sub-sample which is limited to the short window around the acquisition, and no evidence of synergy with respect to acquisitions in the pre-FRS10 period. We cannot establish any statistically significant difference between those periods in terms CF/BVA synergies. However, persistent synergy in terms of adjusted CF/Sales in the post-FRS 10 period (but not in the pre-FR10 period), may suggest that in the post FRS10 period any effect of goodwill in the asset base of the combined firms is offset by a significant increase in profitability. More important, there is significant evidence of increased CF/Sales synergies in the post-FRS10 period in relation to pre-FRS10. Those results suggests that post-FRS10, managers have been engaging with acquisitions characterised by enhanced earnings power in order to offset the adverse effects of recognising goodwill on performance ratios.

Insofar as accounting numbers can inform us about the extent to which M&A activity contribute to shareholder value creation, we should be able to observe such an effect in terms of operating performance improvements. To examine this, we repeat our tests on winner/loser partitions based on the sign of abnormal returns over 36 months, using the ten size portfolios benchmark. Winners exhibit consistent evidence of operating performance improvements, or synergy, throughout all windows examined herein terms of both the adjusted CF/BVA and CF/Sales ratios. The estimated synergy is also sustainable and increasing when considered from the perspective of a longer window. By contrast, acquisitions which destroy value for shareholders are characterised by the lack of any improvement in operating performance or margins. When longer windows are considered, the negative sign of our estimates suggests a deterioration rather than an improvement in terms of both adjusted CF/BVA and CF/Sales; however, those estimates are not statistically significant.<sup>21</sup> We confirm further that the differences in operating performance and margin improvements between acquisitions which create value and those which

<sup>&</sup>lt;sup>20</sup> Heron and Lie (2002) presents inconclusive evidence with respect to synergy in terms of the cash flow margin measure. On the other hand, the findings in Fu, Lin and Officer (2013) and Ghosh (2001) demonstrate significant improvements in cash flow margins for cash acquisitions as opposed to stock-financed acquisitions.

<sup>&</sup>lt;sup>21</sup> In unreported results, we make this partition on the basis of BHARs using the 25 size and book to market portfolios as a benchmark. We find that acquisitions which destroy value for shareholders exhibit a deterioration in adjusted operating performance of a comparable magnitude which is statistically significant as well.

destroy value are statistically significant. We explore this relationship between market outcomes and operating performance further in the following section.

Finally, in line with the expectation that acquisitions taking place within the same industry are more conducive to the development of synergies, we find that "related" acquisitions exhibit significant improvements in terms of adjusted CF/Sales. However, this result does not extend to significant improvements in terms of operating performance synergies. Furthermore, the differences between "related" and "unrelated" are not statistically significant. <sup>22</sup>

#### 4.3 Further analyses

Finally, having shown that abnormal returns are, on average, negative whilst there is at least some evidence of synergies, we run some simple regressions to examine whether BHARs are related to synergistic outcomes. We would expect markets to both respond to accounting information released post-event, but also to some degree to anticipate future earnings and cash flows. Additionally, given the Shleifer and Vishny (2003) hypothesis, and noting the evidence on this hypothesis (Ang and Cheng, 2006 and Dong, Hirshleifer, Richardson and Teoh, 2006 for the US; Bi and Gregory, 2011 for the UK), we would expect pre-bid valuations to predict the returns, together with the bid premium paid. Shleifer and Vishny (2003, henceforth S-V) predict that over-valued acquirers will make stock-financed bids, and specifically *targets in stock acquisitions are undervalued relative to the acquirer* (p.308), whereas: *a more highly valued acquirer only makes a cash bid if the target is under-valued even at the bid price* (p.305), *i.e. that it is absolutely under-valued* (p. 308). Thus *relative* valuations matter for stock bids whilst the absolute valuation of the target should matter for cash bids. Based on these expectations we run the following regression:

 $BHAR = a + b.Q_t + c.RelQ + d.Prem + e.Syn_1 + f.\Delta Syn_2 + g.\Delta Syn_3 + \in (6)$ 

Where:  $Q_t$  is the Tobin's Q quintile group of the target (defined as total market value of equity, debt and preference shares divided by total assets<sup>23</sup>), *RelQ* is the quintile group Tobin's Q of the acquirer divided by the Tobin's Q of the target, *Prem* is the bid premium defined as the target's

<sup>&</sup>lt;sup>22</sup> Exploring this further in unreported results, we cannot establish a significant difference between acquisitions that are related and financed at least partly by stock and acquisitions that are unrelated and financed by cash.

 $<sup>^{23}</sup>$  Note that we use a firm level definition of this variable rather than an equity level one, in order to avoid any problems due to negative net book values and hence negative market/book ratios. These would render the relative Q measure meaningless.

abnormal return in the announcement month,  $Syn_1$  is the synergy defined as the difference between the CF/BVA at t+1 and the CF/BVA at t-1,  $\Delta Syn_2$  is the change in CF/BVA between t+2 and t+1, and  $\Delta Syn_3$  is the change in CF/BVA between t+3 and t+2. Whilst Bi and Gregory (2011) uses a more sophisticated price to residual income value metric to define "over-valuation" and "relative valuation", their metric requires the availability of analysts' forecasts which would further reduce our sample size, so here we use Tobin's Q as a crude proxy for valuation. Following the general procedure in Bi and Gregory (2011), we use quintile groupings of Q to avoid the difficulties caused by extreme observations.

We run two versions of these regressions, one with synergy measured in absolute terms (before industry-adjustment), and one with synergy measured in industry-adjusted terms. We run the regressions using both size and size and book to market matched BHARs, with qualitatively similar results, though for space reasons we only report the former.

One problem with (6) is that it imposes a three year survivorship requirement on the sample of acquirers, and so we run an alternative version where we drop the  $\Delta Syn$  variables, so that we can run the regression for the full sample of firms for which BHARs are reported in Table 5. Further, we focus our reporting on industry adjusted synergistic effects, as we regard these numbers as more meaningful, although we note that the influence of raw synergies is broadly similar to those reported.<sup>24</sup>

The results of these regressions are reported in Table 10, with Panel A covering the full sample (i.e. the Table 5 sample). The first column reports the results for the unpartitioned sample, where it is apparent that the FYE t+1 change in industry-adjusted operating performance around the acquisition is highly significant in explaining the 36-month post bid BHARs. Consistent with the winner-loser analysis discussed above, the implication is that there is a clear relationship between accounting outcomes and market performance. In addition, we observe that consistent with the predictions of the S-V hypothesis the target pre-bid valuation (as proxied by our Q measure) and the relative over valuation of the acquirer (as proxied by our relative Q measure) both have a negative association with long run abnormal returns. However, the bid premium is insignificant in the unpartitioned regression.

Partitioning by form of payment reveals that cash and equity bids have different characteristics. In both, synergy has a strong role in predicting returns. Further, as S-V would predict, the target's

<sup>&</sup>lt;sup>24</sup> Full regression results are available from the authors on request.

pre-bid valuation has a role (though it is only weakly significant in the case of cash bids), but surprisingly, and in contrast with the S-V hypothesis, relative valuation seems to explain returns in cash bids but not in equity bids.

When we partition the sample around the introduction of FRS10, the pre-introduction pattern looks broadly similar to the unpartitioned result. However, disappointingly the regression model performs poorly post the introduction of FRS10, although nonetheless synergy is important in explaining returns. This seems surprising given the results in the previous section, but a closer inspection of the underlying data suggests that this is in part due to the financial crisis. It turns out that by far the worst years for industry-adjusted synergistic changes are from mergers that took place in 2009 and 2008, followed by 1991. These years line up with periods when the economy dipped into recession, suggesting that synergies are quite sensitive to negative shocks in the economy. By contrast, however, the financial crisis years are not the worst years for abnormal returns. The worst years in terms of mean abnormal returns are from mergers conducted in 2003, 1991 and 2002 (see Figure 1).<sup>25</sup>

Finally, we partition the data into related (same industry) and unrelated acquisitions. It turns out that the regressions for unrelated acquisitions have weak explanatory power. Synergies still have an explanatory role but the full regression turns out to be insignificant. By contrast, with related mergers synergies are highly significant in explaining returns, as is the target valuation and relative over-valuation of the acquirer.<sup>26</sup>

In panel B of Table 10, we show the results when the sample is restricted to firms that survive for a full 3 financial years post-merger. This allows us to examine the impact of synergistic gains in years t+2 and t+3, but comes at the cost of imposing further survivorship bias on the sample. As can be seen from the summary data in Table 3, this has an important impact on BHAR, as the sample of surviving firms has BHARs of less than two-thirds those of the full sample, suggesting that non-survivors experience worse returns on average.<sup>27</sup> Starting with the unpartitioned sample, we see that industry-adjusted synergy in year t+1 has a key role in explaining returns.

<sup>&</sup>lt;sup>25</sup> The introduction of IFRS3 is not likely to affect our inference with regard to pre and post-FRS10 period since

we employ a measure of performance which is based on a pre-depreciation and amortisation operating profit.

<sup>&</sup>lt;sup>26</sup> Note that given the earlier evidence on returns in cash financed acquisitions (see Table 6) we tried an alternative regression framework where relatedness was included as a RHS dummy variable. However, in all cases it proved insignificant.

<sup>&</sup>lt;sup>27</sup> Note that firms may not survive for several reasons. First, they could, of course, simply go into liquidation. But they can also become targets themselves, and we know from Table 4 that on average targets tend to under-perform pre-acquisition. Finally, for a small number of acquisitions in the final two years of our study (2011 and 2012), we are necessarily missing the requisite final years' financial data at the time of undertaking this study.

The subsequent change in synergy in year t+2 has a rather weaker role, whilst the year t+3 synergy change has no role. This latter finding is no surprise, as by construction the 36 month BHAR period ends before the publication of the FYE t+3 results, so any association between year t+3 synergy change and returns would essentially come about because the market anticipated the financial outcome. Finally, note that consistent with the S-V hypothesis, the target valuation ( $Q_t$ ) is important in explaining returns as is relative valuation.

Partitioning the sample into cash and stock-financed samples, we find that year t+1 synergy has explanatory power in both sub-samples, but it is only weakly significant for the stock sub-sample. In both cases the change in synergy in year t+2 is now insignificant. However, the change in synergy in year t+3 assumes weak significance in the case of non-cash bids.<sup>28</sup> Consistent with S-V, the target valuation has a weakly significant role in explaining returns in the case of stock-financed bids, but relative valuation is not significant. Note, though, that the regression itself is borderline insignificant. In the case of cash bids, relative valuation and the bid premium have a role in explaining returns.

Partitioning on pre and post FRS 10 periods again yields a result similar to the full sample in the case of the pre-FRS10 period, but unfortunately the F-test for the post-FRS10 period regression is borderline insignificant. Partitioning on relatedness, returns for unrelated acquirers are explained (weakly) by year t+1 synergies and also by the change in synergy in year t+3, although nothing else appears to be significant. For related bids, target valuation, relative valuation and first year synergies explain returns.

#### 5. Conclusions

In this paper, we have first shown that acquisitions continue to be wealth-reducing events even in later years. Further, FRS10 accounting changes appear to have had no strong influence on market outcomes, and any interpretation of changes in performance is benchmark and metric dependent. Unless markets failed to see through the accounting practices that were prevalent under SSAP 22 (which to a degree enabled acquirers to mask poor quality bids by artificially boosting ROE through goodwill write-offs from equity)<sup>29</sup>, this is no surprise. Intriguingly, the

<sup>&</sup>lt;sup>28</sup> Botsari and Meeks(2008) show that earnings in cash and stock-financed acquisitions have different properties (i.e., discretionary accruals). Further research could shed further light on whether earnings quality issues affect our results regarding both the pre and post-acquisition period.

<sup>&</sup>lt;sup>29</sup> See, for example, Smith 1992.

introduction of FRS 10 appears to be associated with a small increase in observed synergies when measured in term of CF/BVA. Further evidence of a genuine and statistically significant gain is found when synergy is measured in terms of CF/Sales. We consider that this as a disciplining effect of imposing the recognition of goodwill; managers engage with more profitable acquisitions in order to offset the adverse effect of including goodwill in the asset base for operating performance. The puzzle is that these apparent operating gains do not carry through into improved market performance.

A key result there is some evidence of synergies being present in the short term at least, although these appear to decline through time. Even more importantly, synergies appear to be present in the "winners" (that is the group where long run abnormal returns are positive), whereas negative or zero synergies are to be found in the "losers". In this respect, accounting performance is associated with market outcomes.

In our regression tests, we try and control for other variables that may explain the relation between market returns and accounting performance. We would expect that market-based outcomes depend not only on the synergies realised, but also on the valuations of the acquirer and target pre-bid, together with the effective premium paid for the target. Our evidence here confirms that all these factors, except the bid premium, assume some importance in explaining post-bid abnormal returns. However, these tests also provide a hint that unusual market conditions in the early years of the 21<sup>st</sup> century, followed by the impact of the financial crisis years, may have had something of a confounding influence on the relationship between accounting performance and market performance in the post-FRS10 period. Despite all these complications, our regression tests on the full sample unambiguously show that synergy, as measured by the improvement in industry-adjusted operating performance, has a highly significant role in explaining abnormal returns. These tests also show that synergies are particularly important explanatory variables in the case of related (same industry) acquisitions.

We started with the question of whether financial reporting can allow us to judge whether M&A activity is successful. The good news here is that accounting numbers allow us to analyse synergy in a way that associates success in accounting terms with success in shareholder returns. The less good news is that well-intended accounting changes have not apparently done anything to limit the scale of value destruction that acquisition activity is associated with. However, in the first place, it would place an intolerable burden on accounting to expect that financial reporting could somehow improve the real world decision making of corporate managers. And

in the second place, we have to acknowledge that according to Shleifer and Vishny (2003), managers of over-valued firms could still be acting in the best interests of their shareholders by exploiting their relative over-valuation to capture less highly valued targets.

Our research has policy implications for the accounting treatment of goodwill. If anything up to two thirds of mergers destroy shareholder value over the 36 months post acquisition, and further that this "loser" group exhibits little or no synergy as in the post acquisition period, one might reasonably expect far more impairment charges to be observed that we actually see. An important implication for the timeliness of financial statement information is that, on average, the accounting treatment of goodwill under current accounting standards may be anything but conservative.

#### References

Agrawal, A. and Jaffe, F.E., 2000. The post-merger performance puzzle. In: C. Cooper and A. Gregory, eds. Advances in Mergers and Acquisitions. New York: JAI Press, 7-41.

Andrade, G. and Stafford, E., 2004. Investigating the economic role of mergers. Journal of Corporate Finance, 10(1), 1-36.

Andrade, G., Mitchell, M., and Stafford, E., 2001. New evidence and perspectives on mergers. Journal of Economic Perspectives, 15(2), 103-120.

Ang, J.S. and Cheng, Y., 2006. Direct evidence on the market-driven acquisition theory. Journal of Financial Research, 29(2), 199-216.

Ang, J.S. and Zhang S., 2004. An evaluation of testing procedures for long horizon event studies. Review of Quantitative Finance and Accounting, 23(3), 251-274.

Barber, B.M. and Lyon, J.D., 1996. Detecting abnormal operating performance: the empirical power and specification of test statistics. Journal of Financial Economics, 41(3), 539-399.

Barber, B.M. and Lyon, J.D., 1997. Detecting long-run abnormal stock returns: the empirical power and specification of test statistics. Journal of Financial Economics, 43(3), 341-372.

Bi, X. and Gregory, A., 2011. Stock market driven acquisitions versus the Q theory of takeovers: the UK evidence. Journal of Business Finance and Accounting, 38 (5-6), 628-656.

Botsari, A. and Meeks, G., 2008. Do acquirers manage earnings prior to a share for share bid? Journal of Business Finance & Accounting, 35(5-6), 633-670.

Carline, N.F., Linn S.C., and Yadav, P., 2009. Operating performance changes associated with corporate mergers and the role of corporate governance. Journal of Banking and Finance, 33 (10), 1829-1841.

Conn, R.L., Cosh, A., Guest, P.M. and Hughes, A., 2005. The Impact on UK Acquirers of Domestic, Cross-border, Public and Private Acquisitions, Journal of Business Finance & Accounting, 32(5-6), 815-869.

Desai, H., and Jain, P. C., 1999. Firm performance and focus: long-run stock market performance following spinoffs. Journal of Financial Economics, 54 (1), 75-101.

Dong, M., Hirshleifer, D., Richardson, S., and Teoh, S.H., 2006. Does investor misvaluation drive the takeover market? Journal of Finance, 61(2), 725-762.

Franks, J. and Harris, R., 1989. Shareholder wealth effects of corporate takeovers: the UK experience 1955-85. Journal of Financial Economics, 23(2), 225-249.

Fu, F., Lin L., and Officer, M.S., 2013. Acquisitions driven by stock overvaluation: are they good deals? Journal of Financial Economics, 109 (1), 24-39.

Espenlaub, S., Gregory, A., and Tonks, I., 2000. Re-assessing the long-term underperformance of UK Initial Public Offerings. European Financial Management, 6(3), 319-342.

Fama, E., 1998. Market efficiency, long-term returns and behavioral finance. Journal of Financial Economics, 49(3), 283-306.

Gadad, A.M., Stark, A.W., and Thomas, H. M., 2009. Divestitures: wealth transfers or real economic gains? Applied Financial Economics, 19(13), 1073-1081.

Ghosh, A., 2001. Does operating performance really improve following corporate acquisitions? Journal of Corporate Finance, 7(2), 151-178.

Gregory, A., 1997. An examination of the long run performance of UK acquiring firms. Journal of Business Finance and Accounting, 24 (7-8), 971-1002.

Gregory, A., 2000. Motives underlying the method of payment by UK acquirers: the influence of goodwill. Accounting and Business Research, 30(3), 227-240.

Gregory, A., Guermat, C., and Al-Shawraweh F., 2010. UK IPOs: long run returns, behavioural timing and pseudo timing. Journal of Business Finance and Accounting, 37(5-6), 612–647.

Harford, J., Humphery-Jenner, M., and Powell, R., 2012. The sources of value destruction in acquisitions by entrenched managers. Journal of Financial Economics, 106(2), 247-261.

Healy, P.M., Palepu, K.G., and Ruback, R.S., 1992. Does corporate performance improve after mergers? Journal of Financial Economics, 31(2), 135-175.

Healy, P.M., Palepu, K.G., and Ruback, R.S., 1997. Which takeovers are profitable? Strategic or financial? Sloan Management Review, 38(4),45-57.

Heron R. and Lie E., 2002. Operating performance and the method of payment in takeovers. Journal of Financial and Quantitative Analysis, 37(1), 137-155.

Higson, C. and Elliott, J., 1998. Post-takeover returns: the UK evidence. Journal of Empirical Finance, 5(1), 27-46.

Jensen, M.C., 1988. Takeovers: their causes and consequences. Journal of Economic Perspectives, 2(1), 21-48.

Kothari, S.P. and Warner, J.B., 1997.Measuring long-horizon security price performance. Journal of Financial Economics, 43(3), 301-339.

Linn, S.C. and Switzer, J.A., 2001. Are cash acquisitions associated with better post combination operating performance than stock acquisitions? Journal of Banking and Finance, 25(6), 1113-1138.

Loughran, T. and Ritter J.R., 2000.Uniformly least powerful tests of market efficiency. Journal of Financial Economics, 55(3), 361-389.

Lyon, J.D., Barber, B.M., and Tsai C-L., 1999. Improved methods for tests of long-run abnormal stock returns. Journal of Finance, 54(1), 165-201.

Manson, S., Stark, A.W., and Thomas, H.M., 1994. A cash flow analysis of the operational gains from takeovers. ACCA Certified Research Report 35. London: Chartered Association of Certified Accountants.

Manson, S., Powell, R., Stark A.W., and Thomas, H.M., 2000. Identifying the sources of gains from takeovers. Accounting Forum, 24(4), 319-343.

Martynova, M., Oosting, S., and Renneboog, L., 2007. The long-term operating performance in European mergers and acquisitions. In: G.N. Gregoriou and L. Renneboog, eds. International mergers and acquisitions activity since 1990: recent research and quantitative analysis. Amsterdam:Wiley-Blackwell, 79-116.

Martynova, M. and Renneboog, L., 2008. A century of corporate takeovers: What have we learned and where do we stand? Journal of Banking and Finance, 32 (2008) 2148–2177.

Mitchell, M.L. and Stafford, E., 2000. Managerial decisions and long-term stock price performance. The Journal of Business, 73(3), 287-329.

Mitchell, M.L. and Mulherin, J. H., 1996. The impact of industry shocks on takeover and restructuring activity. Journal of Financial Economics, 41(2), 193-229.

Moeller S.B., Schlingemann, F.P. and Stulz F.P. Wealth destruction on a massive scale? A study of acquiring firm returns in the recent merger wave. The journal of finance, 60(2), 757-782.

Nobes, C., 1992. A political history of goodwill in the UK: an illustration of cyclical standard setting. Abacus, 28(2), 142-167.

Powell, R.G. and Stark, A.W., 2005. Does operating performance increase post-takeover for UK takeovers? A comparison of performance measures and benchmarks. Journal of Corporate Finance, 11(1-2), 293-317.

Ravenscraft, D.J. and Scherer, F.J., 1989. The profitability of mergers. International Journal of Industrial Organization, 7(1), 101-116.

Roll, R., 1986. The hubris hypothesis of corporate takeovers. Journal of Business, 59(2), 197-216.

Seth, A., Song K. and Pettit, R., 2000. Synergy, materialism or hubris? An empirical examination of motives for foreign acquisitions of US firms. Journal of International Business Studies, 31, 387-405.

Sharma, D.S. and Ho, J., 2002. The impact of acquisitions on operating performance: some Australian evidence. Journal of Business Finance and Accounting, 29(1-2), 155-200.

Shleifer, A. and Vishny, R.W., 2003. Stock market driven acquisitions. Journal of Financial Economics, 70(3), 295-311.

Smith, T., 1992. Accounting for Growth. London: Century.

Sudarsanam, S. and Mahate, A. A., 2003. Glamour acquirers, method of payment and postacquisition performance: the UK evidence. Journal of Business Finance & Accounting, 30(1-2), 299-342.

White, H., 1980. A heteroskedastic-consistent covariance matrix estimator and a direct test of heteroscedasticity. Econometrica, 48(4), 817-838.

#### Table 1

#### Synergy: Evidence from the change and the intercept model

	Deflator	Change model (Industry)	Change model (Matching firms)	Intercept model (Industry)	Intercept model (Matching firms)
Powell and Stark (2005)	MVA	-0.0023	0.0110	0.004	0.016***
Ghosh (2001)	MVA	0.0027	0.0026	0.0240***	
Carline, Linn and Yadav (2009)	MVA			0.0092***	
Linn and Swizer (2001)	MVA	0.0181***			
Healy, Ruback and Palepu (1992)	MVA			0.028**	
Martynova, Oosting and Renneboog (2007)	BVA	-0.01**	-0.0001	0.005	0.005
Powell and Stark (2005)	BVA	-0.0029	0.0081	0.008**	0.012**
Harford, Humphery-Jenner and Powell (2012)	BVA	-0.0089***		0.0082*	
Sharma and Ho (2002)	BVA				0.004
Martynova, Oosting and Renneboog (2007)	Sales	-0.001	0.002	0.243	0.009
Powell and Stark (2005)	Sales	0.0073*	0.0095*	0.016**	0.020***
Ghosh (2001)	Sales		0.0106		
Sharma and Ho (2002)	Sales				-0.159
Healy, Ruback and Palepu (1992)	Sales			0.002	

**Notes:** Prior research measures synergy using cash flow (typically,operating profit before amortisation and depreciation) ratios deflated by various deflators (i.e., market value of assets (MVA); book value of assets (BVA); Sales). Here, we present on overview of the findings of this research. Powell and Stark (2005) examine 191 acquisitions between 1985 and 1993 in the UK. Ghosh (2001) examines 315 acquisitions between 1981 and 1995 in the U.S.A. Carline, Lin and Yadav (2009) examine 81 acquisitions between 1985 and 1994 in the U.K. Linn and Swizer examine 413 acquisitions between 1967 and 1987 in the U.S.A. Healy, Ruback and Palepu (1992) examine 50 acquisitions between 1979 and 1984. Martynova, Oosting and Renneboog (2007) examine 155 acquisitions between 1997 and 2001 in Europe. Harford, Humphery-Jenner and Powell (2012) examine 531 acquisitions between 1980 and 2005 in the U.S.A. Sharma and Ho (2002) examine 36 acquisitions between 1986 and 1991 in Australia.

#### Table 2

## Summary of adjusted operating performance and margin measures

	Deflator	Adjustment	t-1	<i>t-2</i>	t-3	<i>t</i> +1	<i>t</i> +2	<i>t</i> +3
Martynova, Oosting and Renneboog (2007)	BVA	Matching firms	0.0107	0.0159	0.0015	0.0054	0.0067	0.0083
Martynova, Oosting and Renneboog (2007)	BVA	Industry	0.0273	0.0237	0.0189	0.0083	0.0052	0.0134
Powell and Stark (2005)	BVA	Matching firms			0.0034	0.0218	0.0172	0.0224
Powell and Stark (2005)	BVA	Industry			0.0179	0.0232	0.0096	0.0108
Harford, Humphery-Jenner and Powell (2012)	BVA	Industry	0.0566	0.0578	0.0560	0.0520	0.0461	0.0396
Sharma and Ho (2002)	BVA	Matching firms	0.114	0.078	0.047	-0.009	-0.027	0.007
Martynova, Oosting and Renneboog (2007)	Sales	Matching firms	0.0239	0.005	0.009	0.0149	0.0157	0.0148
Martynova, Oosting and Renneboog (2007)	Sales	Industry	0.0435	0.0401	0.0359	0.0311	0.0323	0.0275
Powell and Stark (2005)	Sales	Matching firms			0.0016	0.0232	0.0124	0.0028
Powell and Stark (2005)	Sales	Industry			0.0151	0.0396	0.0206	0.0143
Ghosh (2001)	Sales	Matching firms	0.0173	0.010	0.0084	0.0268	0.0226	0.0083
Sharma and Ho (2002)	Sales	Matching firms	0.087	0.042	0.017	-0.005	-0.005	-0.002

Notes: Martynova, Oosting and Renneboog (2007) examine 155 acquisitions between 1997 and 2001 in Europe. Powell and Stark (2005) examine 191 acquisitions between 1985 and 1993 in the UK. Harford, Humphery-Jenner and Powell (2012) examine 531 acquisitions between 1990 and 2005 in the U.S.A. Sharma and Ho (2002) examine 36 acquisitions between 1986 and 1991 in Australia. Ghosh (2001) examines 315 acquisitions between 1981 and 1995 in the U.S.A.

#### Table 3: Descriptive statistics

#### Panel A: Sample surviving for first financial year

Sample	Full sample			Cash sample			Non-Cash s	Non-Cash sample			Pre-FRS10 sample			Post-FRS10 sample		
Variable	N	Mean	Median	N	Mean	Median	N	Mean	Median	N	Mean	Median	N	Mean	Median	
BHAR_SBM	417	-16.53%	-19.11%	153	-7.27%	-8.85%	264	-21.90%	-26.00%	249	-14.52%	-22.88%	168	-19.52%	-15.77%	
BHAR_Size	417	-19.80%	-21.50%	153	-8.62%	-14.50%	264	-26.28%	-29.37%	249	-20.26%	-26.63%	168	-19.13%	-16.40%	
Prem	417	22.13%	19.57%	153	28.02%	26.20%	264	18.72%	16.98%	249	23.69%	22.56%	168	19.83%	16.01%	
TMV_ac	417	1491487	223961	153	2490581	500500	264	912467	141234	249	968690	199307	168	2266347	285942	
TMV_tg	417	306296	49267	153	189219	52743	264	374148	46654	249	237252	39382	168	408630	70593	
TA_ac	417	1196070	180175	153	1984160	481329	264	739336	108360	249	882148	176844	168	1661346	200474	
TA_tg	417	291518	50829	153	212337	64239	264	337406	47624	249	253622	47368	168	347684	62525	

#### Panel B: Sample surviving for three financial years

Sample	Full sample			Cash sample			Non-Cash s	Non-Cash sample			Pre-FRS10 sample			Post-FRS10 sample		
Variable	N	Mean	Median	N	Mean	Median	N	Mean	Median	N	Mean	Median	N	Mean	Median	
BHAR_SBM	295	-9.77%	-17.22%	110	-5.79%	-10.54%	185	-12.14%	-21.14%	178	-8.94%	-20.57%	117	-11.03%	-8.85%	
BHAR_Size	295	-12.03%	-18.41%	110	-3.57%	-14.30%	185	-17.05%	-21.50%	178	-13.34%	-23.21%	117	-10.03%	-12.24%	
Prem	295	23.73%	20.37%	110	31.68%	28.73%	185	19.00%	17.58%	178	25.25%	23.08%	117	21.41%	16.39%	
TMV_ac	295	1813666	320812	110	3169267	669492	185	1007634	189678	178	1206934	258393	117	2736729	432400	
TMV_tg	295	331263	70475	110	224302	84355	185	394861	54315	178	292196	45417	117	390698	89700	
TA_ac	295	1417706	262779	110	2480185	671099	185	785962	165102	178	1097010	228642	117	1905603	305851	
TA_tg	295	326953	73578	110	256288	80250	185	368970	69723	178	317777	60048	117	340913	89700	

The table provides summary statistics of the post bid buy and hold abnormal returns calculated using a size and book to market benchmark (BHAR\_SBM) and size benchmark (BHAR-Size) together with total market value of acquirer and target (TMV-ac and TMV\_tg respectively) and total assets of acquirer and target (TA\_ac and TA-tg respectively)

Overall										
Acquirer	SBM	BSAt	Sig.	Р	Sig.	Size	BSAt	Sig.	Р	Sig.
12 months	10.58%	4.80	***	0.04	**	10.54%	4.77	***	0.02	**
24 months	25.55%	6.99	***	0.06	*	24.08%	6.70	***	0.02	**
36 months	42.88%	7.66	***	0.05	**	38.74%	6.78	***	0.03	**
Target	SBM	BSAt	Sig.	Р	Sig.	Size	BSAt	Sig.	Р	Sig.
12 months	-3.56%	-1.23		0.14		-3.18%	-1.12		0.26	
24 months	-10.91%	-2.27	**	0.00	***	-12.37%	-2.45	**	0.01	***
36 months	-7.96%	-0.80		0.03	**	-13.92%	-1.33		0.03	
Cash										
Acquirer	SBM	BSAt	Sig.	Р	Sig.	Size	BSAt	Sig.	Р	Sig.
12 months	0.97%	0.37		0.29		1.75%	0.67		0.50	
24 months	11.79%	2.24	**	0.45		11.46%	2.09		0.44	
36 months	18.91%	2.40	**	0.42		15.21%	1.80	*	0.37	
Target	SBM	BSAt	Sig.	Р	Sig.	Size	BSAt	Sig.	Р	Sig.
12 months	0.05%	0.04		0.31		-4.50%	-1.29		0.10	*
24 months	-18.88%	-2.73	***	0.00	***	-18.35%	-2.84	***	0.00	***
36 months	-16.19%	-0.85		0.03	**	-19.51%	-1.00		0.09	*
Stock										
Acquirer	SBM	BSAt	Sig.	Р	Sig.	Size	BSAt	Sig.	Р	Sig.
12 months	16.21%	5.23	***	0.02	**	15.66%	5.23	***	0.01	***
24 months	33.72%	6.90	***	0.05	**	31.63%	6.46	***	0.01	**
36 months	56.87%	7.47	***	0.04	**	52.44%	6.92	***	0.02	**
Target	SBM	BSAt	Sig.	Р	Sig.	Size	BSAt	Sig.	Р	Sig.
12 months	-4.50%	-1.29		0.10	*	-5.35%	-1.56		0.15	
24 months	-6.45%	-0.98		0.06	*	-9.08%	-1.29		0.07	*
36 months	-3.29%	-0.25		0.15		-10.88%	-0.75		0.08	*

Table 4 Pre-bid Buy and hold abnormal returns (BHAR)

The table shows the BHARs relative to the two control portfolios described in the text. SBM is the BHAR relative to a 5x5 size and book to market matched return, whilst Size is the BHAR relative to a size decile return. BSAt is the bootstrapped skewness adjusted t-statistic described in Lyon et al (1999) whilst the p-value is the probability of significance using the non-parametric pseudo-portfolio approach described in that paper. For both tests, \* indicates significance at the 10% level, \*\* at the 5% level, and \*\*\* at the 1% level.

Overall										
Acquirer	SBM	BSAt	Sig.	Р	Sig.	Size	BSAt	Sig.	Р	Sig.
12 months	-4.14%	-1.50		0.01	**	-5.35%	-1.85	*	0.01	**
24 months	-11.26%	-1.52		0.00	***	-14.33%	-1.59		0.00	***
36 months	-16.55%	-2.53	**	0.00	***	-19.80%	-2.58	**	0.00	***
Cash										
Acquirer	SBM	BSAt	Sig.	Р	Sig.	Size	BSAt	Sig.	Р	Sig.
12 months	-2.79%	-0.53		0.23		-3.28%	-0.63		0.12	
24 months	-6.37%	-0.45		0.17		-8.98%	-0.60		0.03	**
36 months	-7.27%	-0.66		0.18		-8.62%	-0.71		0.19	
Stock										
Acquirer	SBM	BSAt	Sig.	Р	Sig.	Size	BSAt	Sig.	Ρ	Sig.
12 months	-4.92%	-1.52		0.01	***	-6.55%	-1.89	*	0.02	**
24 months	-14.10%	-3.06	***	0.00	***	-17.42%	-4.20	***	0.00	***
36 months	-21.92%	-3.10	***	0.00	***	-26.28%	-3.46	***	0.00	***
Pre-FRS10										
Acquirer	SBM	BSAt	Sig.	Р	Sig.	Size	BSAt	Sig.	Р	Sig.
12 months	-2.85%	-0.81		0.09	*	-4.84%	-1.15		0.11	
24 months	-9.61%	-0.87		0.02	**	-14.81%	-0.88		0.00	***
36 months	-14.54%	-1.53		0.00	***	-20.26%	-1.73	*	0.00	***
Post-FRS10										
Acquirer	SBM	BSAt	Sig.	Р	Sig.	Size	BSAt	Sig.	Р	Sig.
12 months	-6.05%	-1.44		0.03	**	-6.11%	-1.38		0.02	**
24 months	-13.70%	-3.41	***	0.00	***	-13.61%	-2.97	***	0.00	***
36 months	-19.52%	-3.30	***	0.00	***	-19.13%	-3.24	***	0.00	***

Table 5 Post-bid Buy and he	old abnormal	returns (BHAR)
-----------------------------	--------------	----------------

The table shows the BHARs for the full sample of 417 acquirers relative to the two control portfolios described in the text. SBM is the BHAR relative to a 5x5 size and book to market matched return, whilst Size is the BHAR relative to a size decile return. BSAt is the bootstrapped skewness adjusted t-statstic described in Lyon et al (1999) whilst the p-value is the probability of significance using the non-parametric pseudo-portfolio approach described in that paper. For both tests, \* indicates significance at the 10% level, \*\* at the 5% level, and \*\*\* at the 1% level.

	Overall Sample				Cash Sar	nple			Share Sample				
Period	mean	median	Ν	Winner	mean	median	Ν	Winner	mean	median	Ν	Share	Winner
				%				%				Sample	%
												Percentage	
1985-	-24.6%	-25.4%	52	25%	-9.2%	-14.4%	14	36%	-30.2%	-29.4%	38	73%	21%
1987													
1988-	-28.1%	-32.3%	99	29%	-23.8%	-20.0%	37	38%	-30.6%	-36.3%	62	63%	24%
1992													
1993-	-11.0%	-20.8%	168	38%	9.4%	-6.4%	63	48%	-23.3%	-25.8%	105	63%	31%
2000													
2001-	-34.8%	-18.8%	25	40%	-35.0%	-19.0%	14	36%	-34.4%	-4.4%	11	44%	45%
2002													
2003-	-21.5%	-22.6%	41	39%	7.5%	-4.8%	12	50%	-33.6%	-39.7%	29	71%	34%
2006													
2007-	-18.7%	-19.8%	32	31%	-25.8%	-16.3%	16	38%	-11.6%	-19.8%	16	50%	25%
2012													
Unrelated	-22.6%	-23.2%	213	29%	-21.4%	-19.6%	76	33%	-23.8%	-25.8%	137	64%	27%
Related	-16.8%	-20.5%	204	39%	5.0%	2.9%	80	51%	-31.0%	-31.7%	124	61%	31%
Overall	-19.8%	-21.5%	417	34%	-7.9%	-14.4%	156	42%	-26.9%	-30.8%	261	63%	29%

## Table 6: Buy and Hold Abnormal Returns by merger wave periods and relatedness

The Table shows the pattern of returns through time, using the "merger wave" periods from Martynova and Renneboog (2008), together with returns classified by "relatedness", where a related acquisition is one in the same Datastream (Level 4) industry. We report mean and median buy and hold abnormal returns (BHAR) where BHAR is calculated using size-matched portfolios. We also report the percentage of positive BHARs ("winners") in each case.

Overall	Fama-Fr	ench		Size and	book to ma	arket	Size		
	alpha	t	Ν	alpha	t	Ν	alpha	t	Ν
12 month alpha	-0.0034	-1.95*	343	-0.0028	-1.75*	343	-0.0039	-2.41**	343
24 month alpha	-0.0053	-3.84***	355	-0.0046	-3.48***	355	-0.0053	-3.66***	355
36 month alpha	-0.0052	-4.09***	357	-0.0054	-4.48***	357	-0.0059	-4.51***	357
Cash	Fama-Fr	ench		Size and	book to ma	arket	Size		
	alpha	t	Ν	alpha	t	Ν	alpha	t	Ν
12 month alpha	-0.0027	-1.11	329	-0.0025	-1.11	329	-0.0033	-1.32	329
24 month alpha	-0.0045	-2.54**	345	-0.0045	-2.62***	345	-0.0054	-2.84***	345
36 month alpha	-0.0035	-2.16**	357	-0.0039	-2.53**	357	-0.0045	-2.63***	357
Stock	Fama-Fr	ench		Size and	book to ma	arket	Size		
	alpha	t	Ν	alpha	t	Ν	alpha	t	Ν
12 month alpha	-0.0042	-2.00**	332	-0.0031	-1.62	332	-0.0048	-2.57**	332
24 month alpha	-0.0061	-3.77***	353	-0.0044	-2.88***	353	-0.0058	-3.72***	353
36 month alpha	-0.0064	-4.33***	355	-0.0060	-4.40***	355	-0.0071	-5.00***	355
Pre-FRS 10	Fama-Fr	ench		Size and	book to ma	arket	Size		
	alpha	t	Ν	alpha	t	Ν	alpha	t	Ν
12 month alpha	-0.0035	-1.95*	179	-0.0027	-1.62	179	-0.0042	-2.53**	179
24 month alpha	-0.0062	-3.77***	191	-0.0049	-2.91***	191	-0.0065	-3.65***	191
36 month alpha	-0.0051	-3.25***	203	-0.0048	-3.06***	203	-0.0056	-3.20***	203
Post FRS 10	Fama-Fr	ench		Size and	book to ma	arket	Size		
	alpha	t	Ν	alpha	t	Ν	alpha	t	Ν
12 month alpha	-0.0022	-0.66	185	-0.0032	-1.04	185	-0.0028	-0.84	185
24 month alpha	-0.0047	-2.10**	197	-0.0038	-1.84*	197	-0.0037	-1.60	197
36 month alpha	-0.0052	-2.61***	199	-0.0054	-3.03***	199	-0.0053	-2.73***	199

#### **Table 7 Post-bid Calendar Time Returns**

The table shows the calendar time alphas from regressions against the Fama-French factors and the two control portfolios described in the text. Regressions employ the Generalised Least Squares (GLS) approach described in Gregory et al (2010), with the resultant t-statistics, and \* indicates significance at the 10% level, \*\* at the 5% level, and \*\*\* at the 1% level. N is the number of months where there are observations in the calendar time portfolios.

	t-3	t-2	t-1	Acquisition	t+1	t+2	t+3
All (n=295)	0.0099	0.0118	0.0107		0.0181	0.0141	0.0064
Benchmark	0.1217	0.1249	0.1254		0.1189	0.1142	0.111
Cash (n=110)	0.013	0.0082	0.0061		0.0133	0.0096	0.0059
Benchmark	0.1232	0.1268	0.1281		0.1207	0.1109	0.1088
Stock (n = 185 )	0.0075	0.0142	0.0129		0.0235	0.0186	0.0102
Benchmark	0.1195	0.1224	0.1227		0.118	0.1167	0.115
Pre- FRS10 (n =178)	0.0116	0.0119	0.0111		0.0158	0.0079	0.0038
Benchmark	0.1281	0.1295	0.1318		0.1331	0.131	0.1245
Post- FRS10 (n= 117)	0.0076	0.0102	0.0104		0.0213	0.0175	0.0133
Benchmark	0.1126	0.1125	0.1127		0.0968	0.0947	0.0977
Winners (n = 104)	0.0089	0.0119	0.0176		0.0310	0.0266	0.0209
Benchmark	0.1215	0.1248	0.1206		0.1149	0.1139	0.1113
Losers (n= 191)	0.0100	0.0109	0.0060		0.0134	0.0050	0.0012
Benchmark	0.1217	0.1249	0.1261		0.1197	0.1150	0.1107
Related (n = 145)	0.0075	0.0078	0.0062		0.0161	0.0099	0.0020
Benchmark	0.1194	0.1189	0.1224		0.1073	0.1079	0.1066
Unrelated (n= 150)	0.0120	0.0140	0.0132		0.0229	0.0194	0.0133
Benchmark	0.1237	0.1280	0.1293		0.1254	0.1176	0.1135

# Table 8: Patterns of operating performance around acquisitions

Panel A: Adjusted CF/BVA

	t-3	t-2	t-1	Acquisition	t+1	t+2	t+3
All (n=295)	0.0167	0.0143	0.0168		0.0272	0.0225	0.0222
Benchmark	0.0894	0.0907	0.0912		0.0935	0.0919	0.0888
Cash (n=110)	0.0169	0.0163	0.0167		0.0239	0.0278	0.0247
Benchmark	0.0904	0.0934	0.094		0.0951	0.093	0.0843
Stock (n = 185 )	0.0154	0.0143	0.0169		0.0324	0.0203	0.0184
Benchmark	0.0869	0.0893	0.089		0.0933	0.0916	0.0906
Pre- FRS10 (n =178)	0.0151	0.0144	0.017		0.0226	0.0202	0.0184
Benchmark	0.092	0.0924	0.0935		0.0995	0.0976	0.0918
Post- FRS10 (n= 117)	0.0169	0.0143	0.0148		0.0436	0.0353	0.0267
Benchmark	0.0848	0.0863	0.086		0.0794	0.0786	0.0838
Winners (n = 104)	0.0168	0.0173	0.0171		0.0338	0.0395	0.0392
Benchmark	0.0922	0.0885	0.0910		0.0916	0.0913	0.0893
Losers (n= 191)	0.0143	0.0125	0.0165		0.0238	0.0153	0.0104
Benchmark	0.0873	0.0910	0.0914		0.0952	0.0929	0.0878
Related (n = 145)	0.0143	0.0125	0.0130		0.0243	0.0217	0.0166
Benchmark	0.0874	0.0871	0.0887		0.0887	0.0909	0.0857
Unrelated (n= 150)	0.0168	0.0159	0.0203		0.0298	0.0232	0.0266
Benchmark	0.0904	0.0916	0.0929		0.0967	0.0926	0.0894

## Table 8: Patterns of operating performance around acquisitions

Panel B: Adjusted CF/SALES

**Notes:** Following Healy et al. (1992) and subsequent research, in Panel A, operating performance is measured as the ratio of CF, *i.e.*, operating profit before depreciation and amortisation to BVA, *i.e.*, the book value of total assets at the beginning of the year. In Panel B, an alternative measure of performance is employed using Sales as a deflator which yields a cash flow margin. We aggregate performance data of the target and acquirer firms before the acquisition to obtain the pro forma pre-acquisition performance of the combined firms. The benchmark's operating performance is the weighted average of target and acquirer industry median operating performance, with the weights being the relative asset (sales) values of the acquirer and target firms each year. In the post- acquisition period the weights used to compute industry returns are the relative asset (sales) values of the acquirer and target firms in year t-1. The industry medians use all firms in the relevant industry classification defined by Datastream's Level 4 groupings. The adjusted operating performance is the difference between the combined firms' raw operating performance and the benchmark's operating performance. We report the medians of both the firm's adjusted and the benchmark's operating performance for each year. Cash acquisitions denote that the method of payment is 100% cash, or cash with a loan note alternative. Stock acquisitions denote that the method of payment is 100% cash, or cash with a loan note alternative. Stock acquisitions denote that the method of payment includes some portion of shares. Post FRS10 acquisitions are defined as acquisitions whose first consolidated financial statements appear after the FRS 10 effective date of 23 December 1998. Winners and losers partitions are defined on the basis of the sign of BHARs whereby abnormal returns are estimated using the ten size portfolios benchmark. Related acquisitions within the same Datastream (Level 4) industry.

	INT	ERCEPT MOD	EL	CH	IANGE MODEL	
	(t+1 to t+3):	(t+1 to t+3):	(t+1) :	(t+1 to t+3) :	(t+1 to t+3) :	(t+1) :
	(t-3 to t-1)	( t-1)	( t-1)	(t-3 to t-1)	( t-1)	( t-1)
All (n=295)	0.0133***	0.0115***	0.0151***	0.0014	0.0030	0.0056**
	3.17	3.15	4.01	0.39	0.89	2.09
Cash (n=110)	0.0108*	0.0116**	0.0121**	-0.0030	0.0000	0.0019
	1.85	2.17	2.22	-0.28	0.23	0.53
Stock (n = 185 )	0.0144***	0.0114**	0.0167***	0.0037	0.0040	0.0068**
	2.62	2.28	3.25	0.70	0.98	2.23
Cash - Stock	-0.0036	0.0002	-0.0046	-0.0067	-0.004	-0.0049
	0.20	0.00	0.38	-0.63	-0.43	-1.04
Pre- FRS10 (n =178)	0.0094	0.0080	0.0125**	-0.0010	0.0014	0.0019
	1.59	1.51	2.42	-0.28	0.25	1.04
Post- FRS10 (n= 117)	0.0196***	0.0171***	0.0190***	0.0053	0.0060	0.0085**
	3.33	3.76	3.37	0.96	1.06	2.02
Pre-FRS10 - Post-FRS10	-0.0102	-0.0091	-0.0065	-0.0063	-0.0046	-0.0066
	1.54	1.68	0.72	-0.82	-0.62	-0.96
Winners (n = 104)	0.0281***	0.0248***	0.0238***	0.0144***	0.0142***	0.0077**
	3.64	3.62	3.50	2.97	3.05	2.34
Losers (n=191)	0.0052	0.0042	0.0103**	-0.0037	-0.0037	0.0020
	1.08	0.99	2.28	-1.54	-1.00	0.90
Winners - Losers	0.0229	0.0206	0.0135	0.0181	0.0179	0.0057
	6.38**	6.60**	2.77*	3.23***	2.86***	1.40
Related (n = 145)	0.0164***	0.0155***	0.0192***	0.0048	0.0051	0.0085**
	2.87	2.88	3.68	0.74	1.32	1.98
Unrelated (n=150)	0.0065	0.0040	0.0074*	0.0001	0.0024	0.0026
	1.28	1.03	1.74	-0.19	-0.06	1.01
Related - Unrelated	0.0099	0.0115	0.0118	0.0047	0.0027	0.0059
	1.71	3.07*	3.07*	0.54	1.00	0.91

# Table 9: Operating performance synergyPanel A: Adjusted CF/BVA

	INTERCEPT MODEL			CHANGE MODEL			
	(t+1 to t+3) :	(t+1 to t+3) :	(t+1) :	(t+1 to t+3) :	(t+1 to t+3) :	(t+1) :	
	(t-3 to t-1)	( t-1)	( t-1)	(t-3 to t-1)	( t-1)	( t-1)	
All (n=295)	0.0327***	0.0311***	0.0450***	0.0073**	0.0052*	0.0062***	
	3.3	3.31	5.11	2.13	1.86	3.63	
Cash (n=110)	0.0341*	0.0318*	0.0231**	0.0138**	0.0119**	0.0089***	
	1.68	1.93	2.24	2.24	2.32	2.89	
Stock (n = 185 )	0.0211**	0.0197**	0.0417***	0.0035	0.0028	0.0052**	
	2.17	2.23	4.04	0.93	0.55	2.36	
Cash - Stock	0.0130	0.0121	-0.0186	0.0103	0.0091	0.0037	
	0.34	0.43	1.63	1.42	1.55	0.72	
Pre- FRS10 (n =178)	0.0048	0.0018	0.0071	0.0003	0.0012	0.0037	
	0.39	0.15	0.77	0.25	0.09	1.36	
Post- FRS10 (n= 117)	0.0579***	0.0558***	0.0740***	0.0138***	0.0128***	0.0133***	
	2.94	2.97	4.47	2.85	2.71	3.90	
Pre-FRS10 - Post-FRS10	-0.0531	-0.0540	-0.0669	-0.0135	-0.0116	-0.0096	
	5.27**	5.94**	12.69***	-2.43**	-2.37**	-2.62***	
Winners (n = 104)	0.0447**	0.0164	0.0151	0.0201***	0.0175***	0.0151***	
	2.10	1.03	1.43	5.09	5.06	4.90	
Losers (n=191)	0.0267**	0.0276**	0.0389***	-0.0029	-0.0055	0.0026	
	2.29	2.38	4.45	-1.11	-1.23	0.96	
Winners - Losers	0.0180	-0.0112	-0.0238	0.0230	0.0230	0.0125	
	0.56	0.32	3.03*	4.79***	4.60***	3.23***	
Related (n = 145)	0.0319***	0.0305***	0.0438***	0.0104*	0.0088*	0.0072***	
	3.99	4.31	4.13	1.95	1.90	2.95	
Unrelated (n=150)	0.0098	0.0119	0.0142	0.0048	0.0048	0.0052**	
	0.50	0.64	0.98	1.02	0.66	2.26	
Related - Unrelated	0.0221	0.0186	0.0296	0.0056	0.0040	0.0020	
	1.10	0.89	2.74*	0.90	1.05	0.91	

# Table 9: Operating performance synergyPanel B: Adjusted CF/Sales

**Notes:** The estimates of synergy reported on Table 9, Panel A in the first three columns consist of the intercept of a regression of the post-acquisition on the pre-acquisition adjusted performance in terms of CF/BVA ("intercept model"). The remaining three columns report the medians of the difference between the paired measures of post and pre-acquisition adjusted performance in terms of CF/BVA ("change model"); the statistical significance in the change model is assessed by means of a Wilcoxon signed rank test. The difference between the partitions presented here are assessed using a Chow test for the "intercept model" and a Mann-Whitney test for the "change model". Panel B presents the corresponding estimates using the adjusted CF/Sales as an alternative measure of performance. The figures in italics are t-statistics.\* indicates significance at the 10% level, \*\* at the 5% level, and \*\*\* at the 1% level (two-tailed).

## Table 10: Regression Tests with BHAR as dependent variable

Panel A: Sample surviving for first financial y	vear
---	------

Group	Full	Cash	Stock	Pre FRS 10	Post FRS10	Unrelated	Related
$Q_t$	-0.0963***	-0.101*	-0.0815**	-0.120**	-0.0793*	-0.0391	-0.144***
	(0.033)	(0.058)	(0.039)	(0.048)	(0.043)	(0.039)	(0.053)
RelQ	-0.0860***	-0.155***	-0.0371	-0.108**	-0.0700	-0.0131	-0.148***
	(0.032)	(0.057)	(0.039)	(0.046)	(0.045)	(0.038)	(0.053)
Prem	-0.00256	-0.293	0.120	-0.188	0.237	-0.0977	0.156
	(0.147)	(0.262)	(0.178)	(0.209)	(0.198)	(0.166)	(0.247)
Syn <sub>1</sub>	2.023***	2.753***	1.409**	2.792***	1.285*	1.517**	2.350***
	(0.574)	(1.012)	(0.691)	(0.873)	(0.706)	(0.734)	(0.879)
_cons	0.328*	0.722**	0.0599	0.506*	0.189	-0.0490	0.608**
	(0.172)	(0.303)	(0.207)	(0.265)	(0.209)	(0.214)	(0.263)
Ν	417	153	264	249	168	213	204
Adj R-sq	0.048	0.100	0.019	0.057	0.032	0.011	0.070
Prob (F)	0.000	0.001	0.066	0.001	0.053	0.185	0.001

Group	Full	Cash	Stock	Pre FRS 10	Post FRS10	Unrelated	Related
$Q_t$	-0.0984**	-0.0980	-0.0837*	-0.108*	-0.104**	-0.0470	-0.137**
	(0.041)	(0.074)	(0.048)	(0.061)	(0.051)	(0.048)	(0.068)
RelQ	-0.0813**	-0.125*	-0.0389	-0.0975	-0.0805	-0.0236	-0.116*
	(0.040)	(0.074)	(0.047)	(0.059)	(0.052)	(0.047)	(0.066)
Prem	-0.135	-0.561*	0.0920	-0.442*	0.354	-0.254	0.00542
	(0.189)	(0.323)	(0.240)	(0.265)	(0.250)	(0.211)	(0.317)
Syn <sub>1</sub>	2.467***	3.834***	1.530*	3.361***	1.230	2.075*	2.675**
	(0.733)	(1.294)	(0.912)	(1.134)	(0.896)	(1.070)	(1.078)
$\Delta Syn_2$	2.059**	3.413	1.133	3.194**	-0.118	1.006	2.723
	(1.021)	(2.798)	(1.071)	(1.437)	(1.396)	(1.185)	(1.733)
$\Delta Syn_3$	1.111	-1.614	1.578*	0.642	1.081	1.751**	0.567
	(0.777)	(1.971)	(0.816)	(1.176)	(0.967)	(0.884)	(1.274)
_cons	0.445**	0.768*	0.187	0.596*	0.368	0.132	0.630*
	(0.213)	(0.389)	(0.251)	(0.335)	(0.243)	(0.264)	(0.329)
Ν	295	110	185	178	117	150	145
Adj R-sq	0.061	0.134	0.022	0.081	0.038	0.032	0.060
Prob (F)	0.001	0.002	0.124	0.002	0.115	0.101	0.024

Panel B: Sample surviving for three financial years

The Table describes regressions of BHAR (defined using ten size-control portfolios) on the following explanatory variables:  $Q_t$  is the Tobin's Q quintile group of the target (defined as total market value of equity, debt and preference shares divided by total assets), RelQ is the quintile group Tobin's Q of the acquirer divided by the Tobin's Q of the target, *Prem* is the bid premium defined as the target's abnormal return in the announcement month,  $Syn_1$  is the synergy defined as the difference between the industry-adjusted CF/BVA at t+1 and the CF/BVA at t-1,  $\Delta Syn_2$  is the change in CF/BVA between t+2 and t+1, and  $\Delta Syn_3$  is the change in CF/BVA between t+3 and t+2. Following the general procedure in Bi and Gregory (2011), we use quintile groupings of Q to avoid the difficulties caused by extreme observations. The figures in parentheses are standard errors. .\* indicates significance at the 10% level, \*\* at the 5% level, and \*\*\* at the 1% level. "Related" refers to an acquisition in the same Datastream Level 4 industry class.



### Figure 1: Mean and median BHARs though time.

The BHARs shown are those from the size adjusted returns. Areas outlined in bold are merger wave periods from Martynova and Renneboog (2008)

Figure 2: Patterns of operating performance around acquisitions



Panel A: Adjusted CF/BVA

Panel B: Adjusted CF/SALES



**Notes:** In Figure 2 we demonstrate the pattern of medians for the benchmark's (dotted line) and the firm's adjusted operating performance (solid line) in terms of CF/BVA in Panel A and CF/Sales in Panel B for the overall sample in this study. The figures employed here are reported in Table 8.