Post-Acquisition Performance and Analyst Following: US Evidence

by

Ray da Silva Rosa, Ross Engel, Mark Moore & David Woodliff

UWA Business School

The University of Western Australia

35 Stirling Highway

Nedlands, 6009

Western Australia

Email: ray.dasilvarosa@uwa.edu.au

Second Draft: April 2003. Comments welcome. Please do not quote without permission

Abstract

We review the long-term post-takeover sharemarket performance of firms that made 502 US corporate acquisitions between 1980-1995 and had data available in the Center for Research in Security Prices (CRSP). In line with earlier research, we find that acquirers involved in mergers, but not tender offers, earned abnormally negative returns in the three-year period following the target delisting. However, the negative performance is driven by firms not included in I|B|E|S analyst coverage. Merging firms covered by analysts exhibit insignificant abnormal performance. We conclude that ostensibly anomalous post-merger performance is driven by a subset of firms for which information costs are higher and therefore non-controversially likely to have share prices that are slower to reflect value-relevant information. We do not resolve all anomalies. We find acquirers who made cash-based tender offers exhibit abnormally positive returns in the three-years following target delisting even after controlling for analyst following and eliminating frequent acquirers.

1.0 Introduction

Merging firms are widely documented to exhibit abnormally poor performance in the post-merger period. The robust finding is prima facie anomalous in highly competitive markets and has generated a considerable literature devoted to explaining it, inspired perhaps by Agrawal, Jaffe and Mandelker's (1992) conclusion, following their impressive investigation, that "the resolution of this anomaly remains a challenge to the profession" (p. 1620).

Two aspects of the anomaly are curious. One is that firms involved in merger, but not tender, offers should systematically experience post-merger negative returns. The other is that markets take considerable time to revise downwards the price of merged entities. Merger activity is common and typically well publicized. It is therefore surprising that investors should, more often than not, consider mergers to be negative NPV investments and be dilatory in incorporating their views in trades.[1]

We present evidence and analysis that goes a considerable way to reconciling the finding of abnormally poor post-merger performance with efficient markets characterized by costly information. Consistent with Hong, Lim and Stein (2000), we show that abnormally poor post-merger performance is associated with analyst following. Using I|B|E|S analyst coverage as a proxy for analyst following, we find that merging firms included in I|B|E|S coverage do not experience significantly poor post-merger performance but non- I|B|E|S covered merging firms do. The share market return to non- I|B|E|S covered firms drives the finding of poor performance, when merged firms are not sorted by analyst coverage. The principal contribution of this paper then is to show that ostensibly anomalous post-merger performance is driven by a subset of firms for which information costs are higher and therefore non-controversially likely to have share prices that are slower to reflect value-relevant information. Importantly, our results are robust to different ways of estimating abnormal return.

[1] The poor post-merger performance of acquiring firms is not a novel finding nor is knowledge of it restricted to financial researchers. For instance, *The Economist*, a well regarded financial news magazine, has reported that "academic studies of all of the big merger waves of this [20th] century have shown clearly that, although shareholders of acquired firms have tended to benefit, those in the acquiring firm have lost" "The trouble with mergers, contd" The Economist Nov 26th 1998

The next few paragraphs place our findings in context by highlighting the links to the literature on analyst following and connecting these links with the post-merger performance anomaly. Research method and data are then described in section II followed by analysis and discussion of results in section III. Concluding comments comprise section IV.

Although novel in the context of research into the post-merger anomaly, our findings are consistent with the substantial evidence linking analyst following with the rate information is impounded in share prices. For instance, Ayers and Freeman (2001) show that price leads of earnings increase with analyst following and institutional ownership while Walther (1997) finds that more sophisticated investors are more likely to heed analysts' forecasts. However, Hong, Lim and Stein's (2000) analysis is particularly pertinent because it potentially explains both why mergers typically presage negative returns and why the below par share return should manifest over a long horizon.

Hong, Lim and Stein (2000) test the hypothesis that stocks with lower analyst coverage should, all else equal, be ones where firm-specific information moves more slowly across the investing public. In doing so they find that stocks with lower analyst coverage react more slowly to bad news than to good. Hong et al contend that "this makes intuitive sense in the context of a theory based on the flow of firm-specific information. Think of a firm that has no analyst coverage but is sitting on good news. To the extent that its managers prefer higher to lower stock prices, they will push the news out the door themselves, via increased disclosures, etc. On the other hand, if the same firm is sitting on bad news, its managers will have much less incentive to bring investors up to date quickly. Thus the marginal contribution of outside analysts in getting the news out is likely to be greater when the news is bad" (p. 268).

Given the plausible assumption that the valuation of merging firms is substantially dependent on firm-specific information then Hong et al's analysis provides a potential explanation for the post-merger performance anomaly. Firms in positive NPV mergers will have their prices reflect their prospects earlier than firms in non-positive NPV mergers as both their managers and analysts strive to get the good news out the door. The rate at which the stock prices of firms in negative NPV mergers reflect the

change in valuation depends on analyst coverage. Analyst covered negative NPV mergers will have the bad news reflected in firms' share prices sooner, possibly even at the time of bid announcement or earlier if news of the impending bid leaks out. Non-analyst covered firms will be slower to have the news impounded in their share price as their managers strive to convey a positive message about the merger. Importantly, the positive slant put on the merger by the managers involved may not necessarily be deceptive in intent. Roll (1986) points out that the period of abnormally good sharemarket performance that characterizes acquiring firms in the pre-bid period may induce hubris in managers and thus they may genuinely (but mistakenly) believe their acquisitions are value-increasing.

An attractive feature of the Hong et al based explanation is that it also potentially accounts for the otherwise puzzling finding that mergers but not tender offers exhibit a secular decline in post-acquisition performance. The better performance of acquirers that make tender offers is typically attributed to the positive signaling consequences of such offers. However, this hypothesis does not satisfactorily explain why the negative signals implicit in mergers should be only slowly impounded in share price. Further, the classification of takeover bids as tender offers or mergers is not clear-cut but is generally based on a host of criteria that vary among researchers and are often difficult to apply. For instance, Schwert (2000) finds that bid hostility, a characteristic commonly used to distinguish tender offers from mergers, is not distinguishable in economic terms but reflects "a perceptual distinction arising from different patterns of public disclosure, where negotiated outcomes are the rule and transactions tend to be characterized as friendly when bargaining remains undisclosed throughout, and hostile when the public becomes aware of the negotiation before its resolution". However, deals where the public becomes aware of the negotiation before resolution are precisely those that are more likely to have higher analyst coverage. These deals are thus more likely to have their terms subject to much greater scrutiny by the investing public and there will be greater likelihood that just positive NPV "hostile" deals will be completed. Our results are consistent with this hypothesis.

Prior to describing our research method and discussing the results, two findings from earlier research on the post-merger anomaly should be addressed. Aggrawal, Jaffe

and Mandelker (1992) observe that abnormally negative returns in the long-run post-merger are consistent with either slow-market adjustment to news of the merger (ie, our conjecture) or are due to unrelated causes that are statistically associated with merger. They reject the slow adjustment hypothesis on the basis of their finding that under-performance is not related to the size of the acquirer relative to the bidder. Aggrawal et al's test implicitly uses relative size of acquisition as a proxy for the level of attention paid to the effects of a merger, however, if both acquirer and target happen to have low analyst coverage then their proxy may be insufficiently accurate to allow them to rigorously test the slow-market adjustment hypothesis.

Investigation of the robustness of the metrics used in assessing post-merger performance have attracted the most attention in attempts to explain the anomaly, with little success. It is well recognized that assessment of long-run abnormal share performance is fraught with difficulties and it remains possibile that post-merger performance is a research design induced anomaly or a chance result. However, as Aggrawal and Jaffe (2000) point out, "many papers, using different methodologies and different sample periods, in both the US and the UK [and Australia], report similar results; and, these same researchers find uniformly non-negative long-run performance following tender offers". The diverse studies with the same findings are strong evidence that under-performance in the post-merger period is not an artifact of research design or chance. Further, our finding that the underperformance found using conventional measures of abnormal performance is a function of analyst following strengthens the argument that the reported underperformance is economically significant.

II Sample selection and research design

To identify the sample of acquisitions, the Center for Research in Security Prices (CRSP) tapes were searched for all New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and National Association of Securities Dealers Automated Quotations (Nasdaq) firms delisted by reason of takeover between 1980-1995. CRSP identifies firms delisted by reason of acquisition with a delisting code between 200 and 203 and a last dividend payment code starting with 32, 37 or 38. The database includes monthly share price data on these firms adjusted for capitalisation changes and dividend payments. Information on the method of financing and mode of

acquisition was obtained from the SDC Platinum database on US acquisitions. Analyst monthly data was taken from I/B/E/S. I/B/E/S collects forecasts from analysts who agree to provide them for free use of I/B/E/S products or data (Rajan & Servaes, 1997, p511).

To assess long-run performance, return data were required for each acquirer for a minimum of 36 months commencing the month following target delisting (justification provided below in discussion of research method). This introduced a potential upward bias into the results, by including only those acquiring firms that had survived over the three-year period.

The largest sample of acquirers included in the study numbered 502 and this was for the period [0, +36] months relative to the target delisting month. The frequency distribution of firms in each year is shown in Table 1.

[Table 1 about here]

Measuring Analyst Coverage

Analyst coverage was defined as the number of analysts who at the takeover month had a 'live' forecast covering any future period. Specifically, all unique analysts who (a) in the previous twelve months and (b) in the previous twenty-four months had issued a forecast covering a period after the takeover month were included. The depth of analyst coverage for the entire market was determined by applying the same criterion to all companies with available I/BE/S data. Sample firms were thus classified as either I/B/E/S-covered firms or non-I/B/E/S-covered firms. The frequency distribution of the sample of acquiring firms separated into these sub-samples is shown in Table 2.

[Table 2 about here]

If I/B/E/S's choice of analyst was random the data used in the study are unbiased. However, Hong, Lim & Stein (2000) note that forecasts from analysts of major brokerage houses are likely over-represented in the I/B/E/S database and brokerage house analysts are more likely to ignore small firms trading on local exchanges. There

are therefore two reasons why an acquiring firm in our sample was not followed by I/B/E/S (1) either analysts did not consider the firm worth following, or (2) I/B/E/S did not obtain forecasts from analysts most likely to follow the firm. The first reason does not affect our experiment. The second reason decreases the likelihood that we will find a significant difference in our samples of analyst-following and non-analyst followed firms since at least some of the non-analyst followed firms will have been misclassified.

Assessing Abnormal Performance

The sample firms' abnormal returns were measured over periods relative to the target firm delisting month. Using the target delisting month is consistent with other research (eg, Mitchell and Stafford 2000) that use the completion month to investigate the same issue. We use the completion month for two reasons. Fama (1998) has noted that long-run buy-and-hold returns are unreliable if abnormal performance occurs early in the event-period that performance is assessed. The outcome of most takeovers is known well before the target delists and so it seems reasonable to attribute any predictable subsequent market abnormal performance as under-reaction. We note that our use of the target delisting date as the start of the post-merger period rather than, say, the date the outcome of the bid is publicized, reduces the odds of observing abnormal performance.

Three proxies of expected return were used: (a) the return to the CRSP value-weighted accumulation index, (b) the return to the CRSP S&P 500 accumulation index, and (c) the return to the sample firms' respective CRSP size-decile of NYSE firms. The measures of abnormal return are described more precisely in Appendix A. As it happens, the size-decile derived measures of abnormal return are most flattering to the acquiring firms, in the sense that they indicate least underperformance in the post-merger period. All discussion refers to the size-decile adjusted return, unless explicitly stated otherwise.

We emphasize that our goal is not a precise measure of the magnitude of abnormal performance attributable to aquisitions but the arguably more tractable goal of assessing the presence of significant abnormal performance subsequent to the date when the value-relevant implications of bids ought to have been unbiasedly

incorporated in share prices. The focus of the study was on testing the extent to which analyst coverage was associated with the sample firms' returns in the post-acquisition period not on rather than on determining a precise measurement of the magnitude of abnormal performance.

The primary event window length over which abnormal returns were estimated was [0, +36][2]. To ensure that all sample firms had been listed for sufficient time to allow analysts to follow them, all acquirers had to have a returns history that spanned a minimum of 61 months, commencing 24 months prior to the target delisting month. Note that this criterion imposes a potential upward bias into results, assuming that survival is a positively valued.

Control Factors

Evidence from earlier research shows a number of characteristics of acquirers are strongly associated with negative long-run post-acquisition abnormal performance. These include the acquirers being involved in a merger as opposed to a tender offer and their use of equity as opposed to cash as consideration. Accordingly, the sample firms were partitioned on these characteristics.

The SDC Platinum Database was the primary source of data on acquiring firm characteristics relating to mode of acquisition and method of financing. The SDC Platinum 'Mergers and Acquisitions Database' includes both US and non-US targets with coverage beginning in 1970. Where mode of acquisition information was not available from SDC Platinum for any given firm, the Wall Street Journal Index was searched. Classification according to mode of acquisition followed the guidelines implicit in Jensen & Rubeck (1983) and followed by other studies. An acquisition was classified as a merger if some of the following characteristics were present: the tone was friendly, the target's managers were favorable or the board of directors and the shareholders voted and approved the deal. An acquisition was classified as a tender offer if some of the following characteristics were present: the tone was aggressive, there was no shareholder meeting or approval, the word tender was used or a percentage of shares sought were mentioned. On some occasions characteristics of

[2] Performance over the following event windows relative to the target delisting month were also reviewed: [0, +3], [0, +6], [0, +9], [0, +12], [+3, +6], [+6, +9], [+9, +12]

both mergers and tender offers were present. Where press reports were inadequate for any satisfactory classification, a classification of 'ambiguous' was made. In the event that SDC Platinum lacked information on an acquisition's method of financing, payment terms were obtained from the Capital Adjustments Register.

III Results and discussion

Results are reported in a similar manner to Loughran & Vijh (1997), by setting up a two-way classification scheme, i.e., separating the acquiring firms by mode of acquisition and method of financing. All abnormal returns reported in tables and discussion are size-decile adjusted average returns, except when explicitly stated otherwise. To preserve concision in discussion without loss of information, statistical significance is indicated by asterisks next to citations of abnormal return; * , **, and *** indicating statistical significance at the 10%, 5% and 1% level respectively, using two-tailed tests of significance.

For the most part, results are consistent with the size-decile adjusted returns when the value weighted market adjusted return and S&P 500 adjusted return are used as proxies for abnormal return.

Abnormal performance, prior to controlling for analyst following

We start by confirming that our sample firms are typical of the samples in similar studies by showing that acquirers in mergers exhibit negative abnormal performance in the post-merger period.

Table 3 shows that the overall sample (comprising firms in mergers and tender offers) of 502 acquisitions had a three-year abnormal return of – 4.46%. The return is insignificant, however, using the return to each firm's size-decile as a proxy for expected return clearly improves relative performance in our sample because the value-weighted market adjusted return over the same period is –15.11%*** and the S&P 500 adjusted return is –7.29%**. These results confirm that inferences about relative long-run performance are heavily dependent on the method used to estimate abnormal performance. Our use of size-decile adjusted returns as the basis for evaluating performance is the most flattering of the three measures.

[Table 3 about here]

Aggrawal and Jaffe (2000) observe that as far back as Jensen and Ruback's (1983) review, the post-merger anomaly has been "framed in terms of performance following mergers" (p. 26). Our finding of insignificant (albeit negative) abnormal performance (on a size-decile adjusted basis) for the whole sample of acquiring firms is therefore in line with the literature. As expected, the anomaly is robustly manifest when mergers and tender offers are reviewed separately. From Table 3 we see the acquirers in 433 mergers earned an abnormal return of – 7.86%*** and the 37 tenders offers earned 19.82%***. The acquirers in the 32 cases too difficult to classify as either tender offers or mergers had no significant abnormal performance.

Method of payment predicts post-merger abnormal performance. Table 3 shows the 293 stock-financed acquisitions had an abnormal return of –7.33%** while the acquirers in 115 cash financed acquisitions, 63 cases of mixed payment and 31 cases of "other payment" showed no significant abnormal performance. The abnormally weak performance of acquirers making stock-based offers and better performance of cash acquirers is consistent with Myers and Maljuf's (1984) information asymmetry hypothesis and evidence from other studies that investigate the impact of method of payment (e.g. Franks, Harris & Titman, 1991; Loughran & Vijh, 1997; da Silva Rosa, Steinbeck, Izan & Walter, 2000; Mitchell & Stafford, 2000). Managers of acquiring firms appear to maximize the wealth of their existing shareholders by paying with stock when their shares are likely to be over-valued and by paying with cash when their shares are likely under-valued. However, stock acquirers tend to be growth firms; hence it might be that both managers and the market were overly optimistic about the firms' growth potential (Loughran & Vijh, 1997, 1775). The issue we address directly is whether over-optimism is ameliorated, if not removed entirely, by analyst following.

Prior to reviewing the impact of analyst following, we note that knowing both method of payment and mode of acquisition allows better predictor of post-merger performance than method of payment alone, although Panel B of Table 1 shows most mergers are financed using stock while cash offers are predominant in tender offers. From Table 3, we see that the 268 stock-financed mergers earned an abnormal return

of –8.91%** while the 23 cash-financed tender offers earned acquirers 20.0%**. The 88 cash-financed mergers and 11 stock-financed tender offers earned insignificant abnormal returns. These findings suggest that cash payment ameliorates the otherwise negative signaling effects of a merger whilst tender offers financed through stock are less positively viewed than cash financed tender offers.

Notwithstanding that our results are consistent with earlier findings (e.g. Loughran & Vijh, 1997; da Silva Rosa, Steinbeck, Izan & Walter, 2000), it is curious that the 23 acquirers in cash financed tender offers earned an abnormal return of 20%** over the three years following target delisting. We might reasonably expect the market to have impounded the positive signaling implications of a cash financed offer by the time the target delists since the information would have been public knowledge at least since the time of offer. A possible explanation is that our post-acquisition results incorporate the impact of subsequent acquisitions. To investigate this, we review performance for the subset of acquirers who do not make subsequent acquisitions within the three-year period following an acquisition. The control is imperfect since subsequent acquisitions are identified only from the same source as our original sample and potentially substantive acquisitions not documented in our source are unknown.

Abnormal Performance, All Acquisitions, Removing Frequent Acquirers

In our sample 69 firms acquired one or more targets within three years following an acquisition covered by our original sample of 502 firms. The specific criterion is that each acquirer was not to have been involved in any subsequent completed acquisition either as acquirer or target in the 36 months following the delisting date of the first acquisition. We recognize that culling our sample in this way introduces a potential downward bias in results if the population of frequent acquirers includes a disproportionate number of firms that are successful in making positive NPV acquisitions.[3] However, our procedure is not without precedent (eg, Baker & Limmack, 2002, p9) and, perhaps more pertinently, a finding that analyst following is negatively associated with abnormal post-merger performance even for infrequent

[3] The direction of the bias is not obvious ex ante. Serial acquirers may also include firms with "over-valued" (in hindsight, at least) stock maximizing the opportunities to expand over the window of opportunity afforded by investors being over-optimistic about their prospects.

acquirers strengthens our argument that ostensibly anomalous post-merger performance is driven by a subset of firms for which information costs are higher

In any event, the results reported in Tables 3 and 4 are not substantially dissimilar. Table 4 shows that the overall sample of 433 non-overlapping acquisitions had a three-year post-merger abnormal return of –7.03%**. The substantially divergent difference in abnormal performance between acquirers involved in mergers and those that made tender offers remains unchanged. The acquirers in 371 mergers had an abnormal return of –11.18%*** while the firms that made 32 tender offers earned 22.54 %***.

[Table 4 about here]

Interestingly, even after culling frequent acquirers, there remains a strong association between method of financing and post-acquisition performance in the three-year period following target delisting. Table 4 shows the firms in 256 stock-financed acquisitions experienced an abnormal return of –9.80 %**. Of the 256 stock-financed acquisitions, 234 were mergers and the firms in this subset had an average abnormal return of –11.73 %*** while the acquirers in 19 cash-financed tender offers earned 22.61**. In sum, even after eliminating frequent acquirers, the post-acquisition returns of acquirer's stock appeared to be related to both the mode of acquisition and method of financing. [4] We draw attention here that our results indicate that the less frequently remarked anomaly of acquirers in cash financed tender offers exhibiting post-acquisition abnormal long-run performance is robust even when firms making subsequent acquisitions within the measurement period are excluded.

Acquisitions With Analyst Coverage, Sans Frequent Acquirers

From here on, we discuss only the results for samples in which overlapping cases are removed. Acquisitions for which it was not possible to determine the mode of acquisition are also excluded, as per Loughran & Vijh (1997).[5] Results from samples

[4] These findings are supported by analysis of sub-samples of acquirers from which Initial Public Offerings (IPOs) were removed. Analysis available on request.

[5] However, results were quite similar when tests were repeated with the aggregate sample of all acquisitions.

including frequent acquirers appear (without discussion) in Tables 8 and 9 in Appendix B.

Recall that we have two proxies for analyst coverage: all unique analysts who (a) in the previous twelve months and (b) in the previous twenty-four months had issued a forecast covering a period after the takeover month were included. Results from each definition of analyst coverage are very similar and so only results from the "12-month analyst coverage" sample are discussed.

Of the 502 acquisitions considered initially in the overall sample, 323 (ie, 64%) received 'analyst coverage'. Table 5 reports the results for I/B/E/S-covered acquisitions, after removing frequent acquirers. The findings documented in Tables 4 and 4 are strikingly different.

[Table 5 about here]

The sample of 271 I/B/E/S-covered acquisitions earned an insignificant abnormal return of –0.71%, which is expected in an informationally efficient market, but diverges substantially from the return of –7.03%** reported in Table 4 for the 433 acquirers not classified by method of payment or mode of acquisition. Further, the insignificant performance persists when the 271 analyst-covered firms are sorted by method of payment and mode of acquisition. The acquirers in 247 mergers (not sorted by method of payment) earned an insignificant –4.29%, while the acquirers in 164 stock-based acquisitions (not sorted by mode of acquisition) earned an insignificant abnormal return of –5.52%.

In sum, the abnormal returns to I/B/E/S-covered firms provide no evidence of significant long-run negative abnormal performance.[6] However, the results are disquieting in one respect. Analyst coverage makes no appreciable difference to the markets' propensity to underestimate the positive signaling implications of cash-based offers. The abnormal return for the 24 I/B/E/S-covered tender offers was 36.11%***. Within this set of 24 firms, the 16 firms that made cash-financed tender offers earned

[6] Results from the sample of I/B/E/S-covered firms over the event windows (0, +3), (0, +6), (+3, +6), (0, +9), (+6, +9), (0, +12), (+9, +12), (0, +36) are available on request.

an abnormal return of 34.79%***. Further, the acquirers in 20 mergers that had mixed financing also earned a significant abnormal return of 15.71%*. Our sample sizes are small and so we prefer not to generalize our findings but we note that Arbarbanell and Bernard (1992) have observed that analysts' underestimate the persistence of earnings and so it is not implausible that they might similarly underestimate the positive implications of cash offers.

Whereas Table 4 reported insignificant results, Table 5 reports significant abnormal returns for the sub-samples of 22 mixed-financed acquisitions and 20 mixed-financed mergers of 18.98%** and 15.71%* respectively. However, the sample sizes are small, making it difficult to generalize with confidence from the results.

Acquisitions Sans Analyst Coverage and Sans Frequent Acquirers

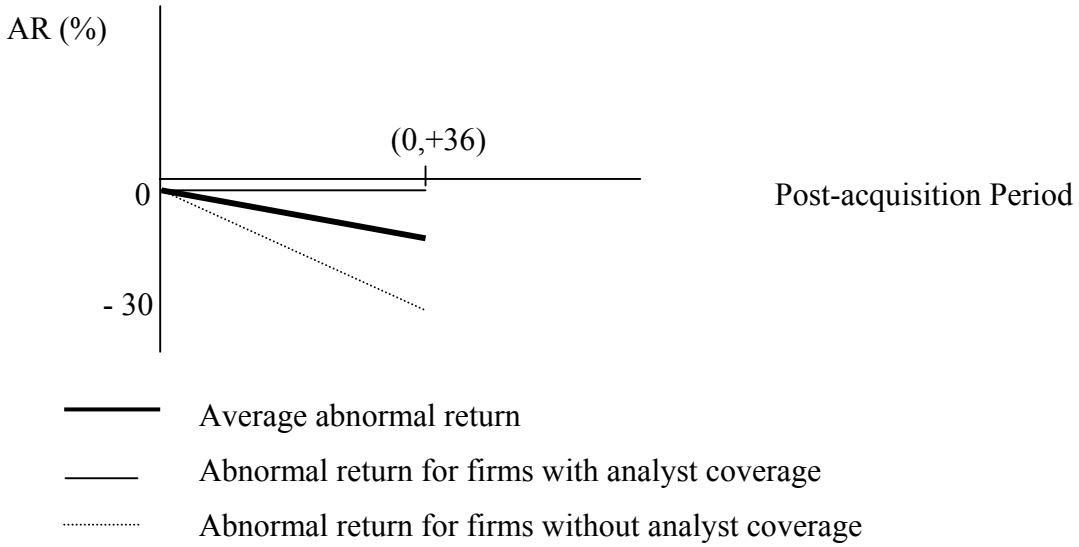
Table 6 reports the results from 132 non-I/B/E/S-covered firms, after culling frequent acquirers.

[Table 6 about here]

Given that the firms with analyst coverage showed substantially improved performance relative to the sample comprising analyst covered and non-analyst covered firms (see Table 4), it is not surprising that Table 6 reveals the non-analyst firms covered firms had the most substandard performance. The overall sample of 132 acquisitions without analyst coverage had an average three-year abnormal return equal to –24.48%***. The vast majority of non-analyst covered acquisitions comprise mergers and so the performance of the 124 acquirers that made mergers closely approximates that of the whole sample of non-analyst covered firms, being –24.89%***.

The small sizes of the non-analyst covered samples that were not stock financed mergers makes it hazardous to generalize findings, however, we note that the largest abnormal loss was experienced by the 26 acquirers that financed their mergers with a mixture of both cash and stock. They earned an abnormal return of –35.11**.

In sum, our findings indicate market efficiency is significantly associated with analyst coverage. In each instance the average abnormal return of the sample of acquisitions with analyst coverage is insignificantly different from zero. The market, however, appears less efficient where acquisitions do not come under the scrutiny of analysts, with the magnitudes of statistically significant negative abnormal performance much greater than those reported for the overall sample of acquisitions. These findings are depicted graphically below:



The suggestion of a relative degree of efficiency in the market with respect to acquisitions receiving analyst coverage, was, however, challenged by the results from the sub-samples of tender offers, mixed-financed acquisitions and cash-financed tender offers.

Results from Regression Analysis

The evidence discussed does not clearly indicate whether the mode of acquisition, form of payment or presence of analyst coverage is a significant determinant of post-acquisition returns in the presence of each other. Further, we have not reviewed the statistical significance of the difference between merger and tender offer abnormal returns, stock and cash acquirer abnormal returns, or analyst-covered and non-analyst-covered acquirer abnormal returns. Table 7 contains findings from regression analysis that address these issues

[Table 7 about here]

Table 7 shows that the regression with the tender offer dummy as an explanatory variable had a co-efficient of 111.60 (*t*-statistic 4.59). Similarly, the regression with the cash payment dummy as an explanatory variable had a co-efficient of 100.40 (*t*-statistic 10.61) With regards to analyst coverage; the regression with the analyst coverage dummy had a co-efficient of 99.83 (*t*-statistic 23.77). The fourth regression included all three dummy variables. The tender offer dummy had a co-efficient of 32.58 (*t*-statistic 1.60), whilst the cash and analyst coverage dummies had significantly significant co-efficients of 42.72 (*t*-statistic 5.35) and 74.35 (*t*-statistic 15.45) respectively.

Results from Table 7 indicate that the mode of acquisition, form of payment and analyst coverage were significant determinants of post-acquisition returns when considered on their own. However, in the presence of each other, only the form of payment and analyst coverage remained as significant determinants. The results confirm a statistically significant difference between merger and tender offer abnormal returns, stock and cash acquirer abnormal returns and analyst-covered and non-analyst-covered acquirer abnormal returns.

An important implication of these findings, consistent with our earlier results, is that widely documented difference in the post-acquisition performance of firms that made mergers and those that made tender offers is attributable to the separate impact of method of payment and analyst following. Tender offers are typically cash-based and made by firms with analyst following.

IV Concluding comments

In closing their study, Hong, Lim and Stein (2000) observe that their test of the link between momentum and analyst following was conducted in light of Fama's (1998) injunction that we should not impressed by models that "simply rationalize those patterns that they were specifically designed to capture. Rather, the acid test should be the "out-of-sample" one: the ability to generate *new* hypotheses that are ultimately borne out in future empirical work" (Hong, Lim and Stein, 2000, p. 293).

Our study arguably fulfils Fama's criterion for impressiveness, in the sense of being more than a data-mining exercise to fit findings to a model.. We test the robustness of Hong, Lim and Stein's (2000) finding that firm-specific information, in particular negative information, diffuses only gradually across the investing public by using analyst following as a proxy for the level of public awareness of firm-specific news about firms involved in takeovers. As predicted, we find that the otherwise puzzling abnormally poor performance of merging firms in post-acquisition period over the long-run is confined to firms that are not followed by analysts.

We do not resolve all puzzles associated with long-run post-merger performance. Our finding that the positive signaling effects of cash offers take some considerable time to be reflected in share prices even when firms are followed by analysts suggests that analyst following is an imperfect proxy for investor awareness of firm specific news. This finding is not particularly surprising in view of earlier, robust evidence that analysts' under-estimate earnings persistence (eg, Abarbanell & Bernard. 1992). Our results indicate that while analysts might not be wholly efficient in processing the implications of all value-relevant signals, they do reasonably well in analyzing the import of merger and acquisition activity.

Several lines of inquiry may be undertaken to shore up our findings and conclusions. The two described next are in process and the results will be incorporated in subsequent drafts of this paper in the near future.

If analyst following is associated with faster investor response to firm-specific news then we expect that the abnormal share price change in the short-run period centred around the announcement of a bid will be inversely proportional to firms' abnormal performance in the long-run following the target delisting. This test fits the description of an "out-of-sample" acid test, and is therefore more credible to Fama (1998) and other skeptics of behavioral models of finance.

We do not control for the association between book-to-market ratio and share return in our tests. The evidence from several studies summarized in Aggrawal and Jaffe (2000) indicates that controlling for book-to-market does not account for the post-merger anomaly. We therefore do not expect our merger related findings to be

substantially altered when we use a Fama and French (1992) three-factor model to generate expected return to our sample firms, however, the model may temper our findings with respect to the association between method of payment and subsequent long-run performance. In this context, it would be interesting to see if firms that make cash bids but are unsuccessful in acquiring their target exhibit positive long-run performance of the same magnitude as our sample firms.

Finally, we suggest that it is remarkable that no research to date has tried to reconcile the findings of abnormally poor performance in the long-run post-merger with accounting measures of performance. A long-cited reason for researchers to favour the use of sharemarket return data over accounting data in assessing post-merger performance has been that sharemarket returns are unbiased and quickly adjust to new information. There is now considerable evidence that challenges this assumption. While there are well recognized difficulties in using accounting data to assess the impact of specific (albeit substantive) corporate events, these are not insuperable over wide event-windows.

References

Abarbanell, J. and V. Bernard. 1992, 'Tests of analysts' overreaction/underreaction to earnings information as an explanation for anomalous price behaviour' *Journal of Finance* vol. 47 pp. 1181-1207.

Agrawal, A., & Jaffe, J.F. 2000, 'The post-merger performance puzzle', *JAI Series: Advances in Mergers and Acquisitions,* [G.Cooper and A.Gregory eds.] JAI, Elsevier Science, Vol.1, Oct. 2000, pp.7-41.

Agrawal, A., Jaffe, J.F. & Mandelker, G.N. 1992, 'The post-merger performance of acquiring firms: a re-examination of an anomaly', *Journal of Finance,* vol. 67, pp. 1605 – 1621.

Da Silva Rosa, R., Izan, H.Y., Steinbeck, A., & Walter, T. 2000, 'The method of payment decision in Australian takeovers: an investigation of causes and effects', *Australian Journal of Management,* vol. 25, no. 1, pp. 67 – 94.

Fama, E. 1998, 'Market efficiency, long-term returns, and behavioural finance', *Journal of Financial Economics*, vol. 49, pp. 283-306.

Fama, E.F, & French, K.R. 1992, ' The cross-section of expected stock returns', *Journal of Finance*, vol. 47, pp. 427-465.

Franks, J., Harris, R.S., & Titman, S.D. 1991, 'The post-merger share price performance of acquiring firms', *Journal of Financial Economics,* vol. 29, pp. 81-96.

Hong, H., T. Lim, J.C. Stein. 2000 'Bad news travels slowlu: Size, analyst coverage, and the profitability of momentum strategies', *Journal of Finance*, vol. 55, pp. 265-295.

Jensen, M.C. & Rubeck, R.S. 1983, 'The market for corporate control: The scientific evidence', *Journal of Financial Economics*, vol. 11, pp. 5-50.

Limmack, R.J., & Baker, R.D. 2002, 'UK takeovers and acquiring company wealth changes: the impact of survivorship and other potential selection biases on post-outcome performance', Working Paper, University of Stirling.

Loughran, T. & Vijh, A.M. 1997, 'Do long-term shareholders benefit from corporate acquisitions?', *Journal of Finance,* vol. 51, no. 5, pp. 1765-1790.

Mitchell, M.L, & Stafford, E. 2000, 'Managerial decisions and long-term stock price performance', *Journal of Business*, vol. 73, no.3, pp. 287- 329.

Myers, S. & Maljuf, N. 1984, 'Corporate financing and investment decisions when firms have information that investors do not', *Journal of Financial Economics*, vol. 13, pp. 187-221.

Roll, R. 1986. The hubris hypothesis of corporate takeovers. *Journal of Business* 59: 197-216.

Schwert, W., 2000, "Hostility in Takeovers: In the Eyes of the Beholder?" *Journal of Finance*, 55: 2599-2640

Walther, B. R., 1997, 'Investor Sophistication and Market Earnings Expectations' *Journal of Accounting Research, Vol 35, No 2, Autumn 1997*

Table 1

Acquiring Firms by Calendar Year, Mode of Acquisition, and Form of Payment, 1980 – 1995

Our sample consists of the acquirors of 502 U.S operating firms identified from CRSP records as delisted due to an acquisition. The acquiring firm had to have share price data available on CRSP on the takeover date and a continuous return series for at least 36 months beginning the month following the target de-listing date. Acquisitions were identifed as being either mergers or tender offers. If press reports provided insufficient information to confidently classify an acquisition as a successful tender offer or merge, it was classified as ambiguous. Method of payment was sorted into four categories: pure stock, pure cash, mixed and other. The mixed payment subset included all acquisitions in which payment terms were neither pure stock nor pure cash. The other payment subset included all acquisitions in which payment terms were other than cash and stock. The market capitalisation values of acquiring firms are as at the target de-listing date.

Panel A: Number of Acquisitions by Calendar Year

Year	Total Number of Acquisitions	Number of Mergers	Number of Tender Offers	Number of Ambiguous	Number of Stock	Number of Cash	Number of Mixed	Number of Other
1980	36	34	0	2	24	0	12	0
1981	28	27	0	1	17	4	6	0
1982	34	27	3	4	20	8	6	0
1983	27	25	2	0	14	8	3	2
1984	28	26	1	2	14	6	5	3
1985	13	11	2	0	6	3	0	4
1986	40	33	4	3	22	11	3	4
1987	49	46	2	1	28	14	3	4
1988	45	41	2	2	30	9	4	3
1989	33	26	4	3	20	8	2	3
1990	30	24	2	4	16	9	4	1
1991	17	13	2	2	10	4	2	1
1992	23	18	2	3	11	7	3	2
1993	24	21	2	1	16	6	0	2
1994	29	23	4	2	15	8	6	0
1995	46	38	5	3	30	10	4	2
Total	502	433	37	32	293	115	63	31

Panel B: Mode of Acquisition

Form of Payment	Merger	Tender Offer	Ambiguous	All
Stock	268	11	14	293
Cash	88	23	4	115
Mixed	51	2	10	63
Other	26	1	4	31
All	433	37	32	502

The overall sample consisted of 502 U.S operating firms delisted from the Center for Research in Security Prices (CRSP) tapes due to an
at the takeover month had a 'live' forecast covering any future period in the I|B|E|S database. Specifically, all unique analysts who (a) in
the totals for 24-month analyst coverage are reported in the table for comparison (in italics).

Year	Total No of Acquisitions
1980	3
1981	13
1982	18
1983	22
1984	20
1985	10
1986	26
1987	36
1988	34
1989	25
1990	23
1991	10
1992	16
1993	18
1994	18
1995	31
Total	**323**
Total: 2 yr analyst coverage	*316*

Form of Payment	Merger
Stock	183
Cash	65
Mixed	24
Other	22
All	294
Total: 2 yr analyst coverage	*286*

Table 3

Acquirer Returns Sorted by Mode of Acquisition and Method of Payment, 1980-1995

The sample consists of 502 U.S operating firms delisted from the Center for Research in Security Prices (CRSP) tapes due to an acquisition. The acquiring firm must have been listed on CRSP on the takeover date and have had a continuous return series for at least 36months beginning the month following the target de-listing date, which is the period post-acquisition abnormal performance was estimated. An acquisition was categorised as ambiguous if press reports were inadequate for any satisfactory classification. Acquisitions were also classified into four forms of payment. The *mixed payment* subset includes all acquisitions in which payment terms were neither pure stock nor pure cash. The *other payment* subset includes all acquisitions in which payment terms included consideration other than stock or cash. Starting the month following the target de-listing date, abnormal returns were calculated for up to three years following the acquisition. The proxy for expected return was the return to the sample firm's respective NYSE size-decile (by market capitalization) formed in the month prior to the start of the event-window. Numbers in parentheses are test Student's *t*-statistics.

		Mode of Acquisition			
Method of Payment	Statistic	Mergers	Tender Offers	Ambiguous	All Acquisitions
Stock	1. Sample size	268	11	14	293
	2. NY decile 3yr AR	- 8.91 (-2.48)**	11.92 (1.18)	7.89 (0.77)	- 7.33 (2.12)**
Cash	1. Sample size	88	23	4	115
	2. NY decile 3yr AR	- 0.05 (-.074)	20.00 (2.30)**	12.32 (1.88)	4.39 (0.61)
Mixed	1. Sample size	51	2	10	63
	2. NY decile 3yr AR	- 9.76 (-1.03)	51.69 (3.10)	22.01 (1.01)	- 2.77 (-0.74)
Other	1. Sample size	26	1	4	31
	2. NY decile 3yr AR	- 18.28 (-1.19)	38.75 (n/a)	12.84 (1.71)	- 12.42 (-0.88)
All	1. Sample size	433	37	32	502
	2. NY decile 3yr AR	- 7.86 (-2.66)***	19.82 (3.13)***	13.48 (0.86)	- 4.46 (-1.44)

*** Significant at the 1% level (two-tailed test)
** Significant at the 5% level (two-tailed test)
* Significant at the 10% level (two-tailed test)

Table 4

Acquirer Returns, by Mode of Acquisition and Method of Payment, Removing Overlapping Cases, 1980-1995

This table includes the 433 firms that are a subset of the 502 U.S operating firms delisted from the Center for Research in Security Prices (CRSP) tapes due to an acquisition between 1980-1995 that satisfy the following criteria: (1) The acquiring firm must have been listed on CRSP on the takeover date and have had a continuous return series for 36months beginning the month following the target de-listing date; (2) Information on the method of financing and mode of acquisition must have been available from either the SDC Platinum database or external sources; (3) The acquirer must not have been involved in any subsequent completed acquisition either as an acquirer or a target in the 36months following the de-listing date of the first acquisition. Starting the month following the target de-listing date, abnormal returns were calculated for up to three years following the acquisition. Numbers in parentheses are test Student's *t*-statistics

Method of Payment	Statistic	Mergers	Tender Offers	Ambiguous	All Acquisitions
Stock	1. Sample size	234	10	12	256
	2. NY decile 3yr AR	- 11.73 (-4.40)***	17.42 (1.50)	5.08 (0.85)	- 9.80 (-2.57)**
Cash	1. Sample size	67	19	4	90
	2. NY decile 3yr AR	- 3.92 (-0.48)	22.61 (2.21)**	12.32 (1.88)	2.40 (0.36)
Mixed	1. Sample size	46	2	10	58
	2. NY decile 3yr AR	- 13.02 (-1.28)	51.69 (3.10)*	22.01 (1.01)	- 4.75 (-1.03)
Other	1. Sample size	24	1	4	29
	2. NY decile 3yr AR	- 22.49 (-1.39)	38.75 (n/a)	12.84 (1.71)	- 15.50 (-1.11)
All	1. Sample size	371	32	30	433
	2. NY decile 3yr AR	- 11.18 (-3.37)***	22.54 (3.20)***	12.72 (1.30)	- 7.03 (-2.01)**

*** Significant at the 1% level (two-tailed test)
** Significant at the 5% level (two-tailed test)
* Significant at the 10% level (two-tailed test)

Table 5

Acquirer Returns Sorted by the Mode of Acquisition and Method of Payment for All I/B/E/S-Covered Firms, Removing Overlapping Cases, 1980-1995

This table includes the subsets of I/B/E/S- Covered Firms from the overall 502 U.S operating firms delisted from the Center for Research in Security Prices (CRSP) tapes due to an acquisition between 1980-1995.This subset of firms satisfied the following criteria: (1) The acquiring firm must have been listed on CRSP on the takeover date and have had a continuous return series for 36 months beginning the months following the target de-listing month; (2) Each firm must have satisfied the definition of 'analyst coverage' (3) Information on the method of financing and mode of acquisition must have been available from either the SDC Platinum database or external sources; (4) The mode of acquisition was not ambiguous; (5) Overlapping cases were not included (i.e. each acquirer must not have been involved in any subsequent completed acquisition either as an acquirer or a target in the 36months following the de-listing date of the first acquisition. Starting the month following the target de-listing date, abnormal returns were calculated for up to three years following the acquisition. Numbers in parentheses represent test statistics.

PANEL A: One Year Analyst Coverage

		Mode of Acquisition		
Method of Payment	Statistic	Mergers	Tender Offers	All Acquisitions
Stock	1. Sample size	159	5	164
	2. NY decile 3yr AR	- 6.47 (-1.37)	33.55 (3.48)*	- 5.52 (-1.13)
Cash	1. Sample size	48	16	64
	2. NY decile 3yr AR	0.89 (0.10)	34.79 (4.48)***	9.36 (1.33)
Mixed	1. Sample size	20	2	22
	2. NY decile 3yr AR	15.71 (1.94)*	51.69 (3.10)	18.98 (2.45)**
Other	1. Sample size	20	1	21
	2. NY decile 3yr AR	- 19.37 (-1.16)	38.76 (n/a)	- 16.61 (-1.03)
All	1. Sample size	247	24	271
	2. NY decile 3yr AR	- 4.29 (-1.13)	36.11 (6.43)***	- 0.71 (-0.20)

PANEL B: Two Year Analyst Coverage

		Mode of Acquisition		
Method of Payment	Statistic	Mergers	Tender Offers	All Acquisitions
Stock	1. Sample size	156	6	162
	2. NY decile 3yr AR	- 5.90 (-1.26)	30.26 (3.55)**	- 4.56 (-1.00)
Cash	1. Sample size	46	16	62
	2. NY decile 3yr AR	3.21 (0.37)	34.79 (4.48)***	11.36 (1.63)
Mixed	1. Sample size	21	2	23
	2. NY decile 3yr AR	23.09 (2.98)***	51.69 (3.11)	27.56 (3.48)***
Other	1. Sample size	19	1	20
	2. NY decile 3yr AR	- 19.87 (-1.13)	38.76 (n/a)	- 16.94 (-1.00)
All	1. Sample size	242	25	267
	2. NY decile 3yr AR	- 2.76 (-0.73)	35.21 (6.45)***	0.81 (0.23)

*** Significance at 1% level (two-tailed test)
** Significance at 5% level (two-tailed test)
* Significance at 10% level (two-tailed test)

Table 6

Acquirer Returns Sorted by the Mode of Acquisition and Method of Payment for All Non-I/B/E/S-Covered Firms, Removing Overlapping Cases, 1980-1995

This table includes the subsets of Non-I/B/E/S- Covered Firms from the overall 502 U.S operating firms delisted from the Center for Research in Security Prices (CRSP) tapes due to an acquisition between 1980-1995.This subset of firms satisfied the following criteria: (1) The acquiring firm must have been listed on CRSP on the takeover date and have had a continuous return series for 36 months beginning the months following the target de-listing month; (2) Each firm must not have satisfied the definition of 'analyst coverage' (3) Information on the method of financing and mode of acquisition must have been available from either the SDC Platinum database or external sources; (4) The mode of acquisition was not ambiguous; (5) Overlapping cases were not included (i.e. each acquirer must not have been involved in any subsequent completed acquisition either as an acquirer or a target in the 36months following the de-listing date of the first acquisition. Starting the month following the target de-listing date, abnormal returns were calculated for up to three years following the acquisition. Numbers in parentheses represent test statistics.

PANEL A: Non-I/B/E/S -One Year Analyst Coverage

		Mode of Acquisition		
Method of Payment	Statistic	Mergers	Tender Offers	All Acquisitions
Stock	1. Sample size	75	5	80
	2. NY decile 3yr AR	- 22.87 (-3.31)***	- 3.67 (-0.23)	- 21.67 (-3.31)***
Cash	1. Sample size	19	3	22
	2. NY decile 3yr AR	- 16.05 (-0.84)	- 42.35 (-1.32)	- 19.64 (-1.16)
Mixed	1. Sample size	26	0	26
	2. NY decile 3yr AR	- 35.11 (-2.23)**		- 35.11 (-2.23)**
Other	1. Sample size	4	0	4
	2. NY decile 3yr AR	- 38.08 (-0.67)		- 38.08 (-0.67)
All	1. Sample size	124	8	132
	2. NY decile 3yr AR	- 24.89 (-3.99)***	- 18.18 (-1.15)	- 24.48 (-4.13)***

PANEL B: Non-I/B/E/S - Two Year Analyst Coverage

		Mode of Acquisition		
Method of Payment	Statistic	Mergers	Tender Offers	All Acquisitions
Stock	1. Sample size	78	4	82
	2. NY decile 3yr AR	- 23.40 (-3.33)***	- 8.04 (-0.41)	- 22.65 (-3.36)***
Cash	1. Sample size	21	3	24
	2. NY decile 3yr AR	- 19.54 (-1.09)	- 42.35 (-1.32)	- 22.39 (-1.39)
Mixed	1. Sample size	25	0	25
	2. NY decile 3yr AR	- 43.35 (-2.84)***		- 43.35 (-2.84)***
Other	1. Sample size	5	0	5
	2. NY decile 3yr AR	- 32.44 (-0.73)		- 32.44 (-0.73)
All	1. Sample size	129	7	136
	2. NY decile 3yr AR	- 26.99 (-4.40)***	- 22.74 (-1.30)	- 26.77 (-4.56)***

*** Significance at 1% level (two-tailed test)
** Significance at 5% level (two-tailed test)
* Significance at 10% level (two-tailed test)

Table 7

Regression Analysis of Post-acquisition Abnormal Returns on Mode of Acquisition, Form of Payment and Analyst Coverage, 1980-1995

This table includes the subset of 407 firms from the overall sample of 502 firms that satisfied the following criteria: (1) The mode of acquisition was not ambiguous; (2) Overlapping cases were not included (i.e. each acquirer must not have been involved in any subsequent completed acquisition either as an acquirer or a target in the 36months following the de-listing date of the first acquisition. Starting the month following the target de-listing date, abnormal returns were calculated for three years following the acquisition for each acquiring firm. The tender offer dummy equalled 0 if the target was acquired in a merger and 1 if acquired in a tender offer. The cash payment dummy equalled 0 if the acquirers paid in equity and 1 if paid in cash. The analyst coverage dummy equalled 0 if the acquiring firm did not satisfy the definition of analyst coverage (see ch4.3.2) and 1 if it did satisfy the definition of analyst coverage. For example regressions four has the following specification.

$$\begin{aligned}\text{Post - acquisition abnormal return} = {} & \text{Intercept} \\ & + b_1 * \text{Tender offer dummy}, \\ & + b_2 * \text{Cash payment dummy}, \\ & + b_3 * \text{Analyst coverage dummy} + e_i\end{aligned}$$

Numbers in parentheses represent test statistics. Standard errors used in the calculation of the test statistics were White-adjusted to correct for heteroskedasticity.

	Dependent Variable: Post-acquisition Abnormal Return (NYSE Decile 3yr AR) (N= 407)					
Independent Variable	1	2	3	4	5	6
Intercept	- 10.50 (-3.40)	- 8.90 (-3.21)	- 8.02 (-3.96)	- 9.04 (-4.35)	- 4.46 (-1.97)	- 9.34 (-4.72)
Tender Offer Dummy	111.60 (4.59)				32.58 (1.60)	8.77 (0.53)
Cash Dummy		100.40 (10.61)			42.72 (5.35)	50.23 (6.83)
Analyst Coverage Dummy (1yr)			99.83 (23.77)		74.35 (15.45)	
Analyst Coverage Dummy (2yr)				100.22 (22.68)		88.98 (19.93)

APPENDIX A: Share return definitions

Appendix A describes the share return data used in this study. All prices were adjusted for dividends paid, and capitalization changes.

Measuring long - horizon returns

The monthly return on a security was defined as:

$$R_{j,t} = \ln \frac{P_{j,t}}{P_{j,t-1}}$$

where:

$R_{j,t}$ = the return on stock 'j' for month 't'.
$P_{j,t}$ = the price of security 'j' at month 't'.
$P_{j,t-1}$ = the price of security 'j' at month 't-1'.

The return on each security was calculated monthly and then summed over a specified period to determine the total return for the firm in that period.

$$R_{j(t,t+n)} = \sum_{t=1}^{t=n} R_{j,t}$$

where:

$R_{j(t,t+n)}$ = the return on stock 'j' over the period (t,t+n).

$R_{j,t}$ = the return on stock 'j' for month 't'.

The average monthly return experienced by each acquiring firm was then calculated.

$$R_{(t,t+n)} = \frac{\sum_{j=1}^{N} R_{j(t,t+n)}}{N}$$

where:

$R_{(t,t+n)}$ = the average monthly abnormal return for acquiring firms in a given data sample containing 'N' companies over the period (t,t+n).

$R_{j(t,t+n)}$ = the return on stock 'j' over the period (t,t+n).

t = the number of months in the specified period (t, t+n).

Benchmarking

Judging a security's return as 'abnormal' required that it be benchmarked against some measure of expected return. Returns of firms in the sample were compared to: (1) the CRSP value-weighted return accumulation index (2) the CRSP S&P 500 return accumulation index (3) the appropriate CRSP size decile of NYSE firms.

The CRSP value-weighted return accumulation index carries the code 'VWRETD' in the CRSP database. It contains the returns, including all distributions, on a value-weighted market portfolio. The CRSP S&P 500 return accumulation index carries the code 'SP Return' in the CRSP database. The CRSP S&P Index contains standard value –weighted returns for a market of stocks as identified by the S&P 500 Composite Index. Market capitalization deciles are created by CRSP by ranking all of the NYSE stocks (excluding ADRs, REITs, foreign companies and closed-end funds) and dividing them into ten groups based upon market capitalization. Decile one contains the largest companies and decile ten the smallest companies based upon market capitalization rankings.

Abnormal return – market adjusted (2 indices)

The monthly return on an index 'm' was defined as:

$$R_{m,t} = \ln \frac{P_{m,t}}{P_{m,t-1}}$$

where:

$R_{m,t}$ = the return on index 'm' for month 't'.

$P_{m,t}$ = the value of index 'm' at time 't'.

$P_{m,t-1}$ = the value of index 'm' at time 't-1'.

The monthly abnormal return experienced by a given stock relative to the two accumulation indices was defined as follows:

$$AR_{j,t} = R_{j,t} - R_{m,t}$$

where:

$AR_{j,t}$ = the abnormal return experienced by stock 'j' in month 't'.

$R_{j,t}$ = the return on stock 'j' in month 't'.

$R_{m,t}$ = the return on index 'm' in month 't'.

The monthly abnormal return for each stock was then summed to determine the total abnormal return experienced by each acquiring firm relative to each of the two indices.

$$AR_{j(t,t+n)} = \sum_{t=1}^{t=n} AR_{j,t}$$

where:

$AR_{j(t,t+n)}$ = the abnormal return experienced by stock 'j' over the period (t, t+n).

$AR_{j,t}$ = the abnormal return experienced by stock 'j' in month 't'.

The total abnormal return experienced by firms comprising each individual sample considered in the analysis was next calculated.

$$AR_{p(t,t+n)} = \sum_{j=1}^{j=P} AR_{j,(t,t+n)}$$

where:

$AR_{p(t,t+n)}$ = the abnormal return experienced by a sample of acquiring firms 'p' during the period (t, t+n).

$AR_{j(t,t+n)}$ = the abnormal return experienced by stock 'j' over the period (t, t+n) where stock 'j' is a member of sample 'p' (j = 1,…..,P.).

Finally, the average abnormal return experienced by firms comprising each individual sample considered in the analysis was calculated according to the following equation:

$$\overline{AR}_{p(t,t+n)} = \frac{AR_{p(t,t+n)}}{P}$$

where:

$\overline{AR}_{p(t,t+n)}$ = the average abnormal return experienced by each acquiring firm 'j' in a given sample of acquiring firms 'p' over the period (t,t+n).

$AR_{p(t,t+n)}$ = the abnormal return experienced by a data sample of acquiring firms 'p' over the period (t, t+n).

P = the number of acquiring firms in a given sample of acquiring firms 'p'.

Abnormal return – size adjusted

The market capitalization was initially determined monthly for every firm in the overall sample of acquiring firms. Monthly market capitalisation for each firm was defined as:

$$Cap_{j,t} = S_{j,t} * P_{j,t}$$

where:

$Cap_{j,t}$ = the market capitalisation of firm 'j' for month 't'.

$S_{j,t}$ = the number of firm 'j's' fully paid ordinary shares outstanding at the end of month 't'.

$P_{j,t}$ = the quoted price of firm 'j's' fully paid ordinary shares at the end of month 't'.

Firms were assigned to their size-deciles on the basis of their market capitalisation, as defined above. Each firm remained within its assigned size decile during the course of each month but could be assigned to a different size decile in subsequent months depending on changes to the market capitalisation value.

The monthly return on each size decile was defined as:

$$size_{j,t} = \ln \frac{P_{j,t}}{P_{j,t-1}}$$

where:

$size_{j,t}$ = the return on the decile assigned to firm 'j' for month 't'.

$P_{j,t}$ = the value of the NYSE index for the decile assigned to firm 'j' at time 't'.

$P_{j,t-1}$ = the value of the NYSE index for the decile assigned to firm 'j' at time 't-1'.

The monthly abnormal return experienced by a given stock relative to the return on its appropriate size decile was then calculated.

$$AR_{j,t} = R_{j,t} - size_{j,t}$$

where:

$AR_{j,t}$ = the abnormal return experienced by stock 'j' in month 't'.

$R_{j,t}$ = the return on stock 'j' in month 't'.

$size_{j,t}$ = the return on the decile assigned to firm 'j' for month 't'.

The monthly abnormal return for each stock was next summed to determine the total abnormal return experienced by each acquiring firm relative to the return on its appropriate size decile.

$$AR_{j(t,t+n)} = \sum_{t=1}^{t=n} AR_{j,t}$$

where:

$AR_{j(t,t+n)}$ = the abnormal return experienced by stock j over the period *(*t, t+n).

$AR_{j,t}$ = the abnormal return experienced by stock 'j' in month 't'.

The total abnormal return experienced by firms comprising each individual sample considered in the analysis was calculated according to the following equation:

$$AR_{p(t,t+n)} = \sum_{j=1}^{j=P} AR_{j,(t,t+n)}$$

where:

$AR_{p(t,t+n)}$ = the abnormal return experienced by a sample of acquiring firms 'p' during the period (t, t+n).

$AR_{j(t,t+n)}$ = the abnormal return experienced by stock 'j' over the period (t, t+n) where stock 'j' is a member of sample 'p' (j = 1,….., P).

Finally, the average abnormal return experienced by firms comprising each individual sample considered in the analysis was calculated.

$$\overline{AR}_{p(t,t+n)} = \frac{AR_{p(t,t+n)}}{P}$$

where:

$\overline{AR}_{p(t,t+n)}$ = the average abnormal return experienced by each acquiring firm 'j' in a given sample of acquiring firms 'p' over the period (t,t+n).

$AR_{p(t,t+n)}$ = the abnormal return experienced by a data sample of acquiring firms 'p'. over the period (t, t+n).

P = the number of acquiring firms in a given sample of acquiring firms 'p'.

APPENDIX B: Results when frequent acquirers remain in the sample

Table 8

Acquirer Returns by Mode of Acquisition and Method of Payment, for All I/B/E/S-Covered Firms, 1980-1995

This table includes the subsets of I/B/E/S- Covered Firms from the overall 502 U.S operating firms delisted from the Center for Research in Security Prices (CRSP) tapes due to an acquisition between 1980-1995.This subset of firms satisfied the following criteria: (1) The acquiring firm must have been listed on CRSP on the takeover date and have had a continuous return series for 36 months beginning the months following the target de-listing month; (2) Each firm must have satisfied the definition of 'analyst coverage' (3) Information on the method of financing and mode of acquisition must have been available from either the SDC Platinum database or external sources; (3) The mode of acquisition was not ambiguous. Starting the month following the target de-listing date, abnormal returns were calculated for the 36-months following the target delisting month. Numbers in parentheses are Student's *t*-statistics.

PANEL A: One Year Analyst Coverage

		Mode of Acquisition		
Method of Payment	Statistic	Mergers	Tender Offers	All Acquisitions
Stock	1. Sample size	183	6	189
	2. NY decile 3yr AR	- 4.07 (-0.96)	24.93 (2.14)*	- 3.15 (-0.76)
Cash	1. Sample size	65	20	85
	2. NY decile 3yr AR	3.04 (0.46)	29.36 (4.18)***	9.23 (1.69)*
Mixed	1. Sample size	24	2	26
	2. NY decile 3yr AR	14.16 (1.93)*	51.69 (3.11)	17.05 (2.40)**
Other	1. Sample size	22	1	23
	2. NY decile 3yr AR	- 14.68 (-0.93)	38.76 (n/a)	- 12.36 (-0.81)
All	1. Sample size	294	29	323
	2. NY decile 3yr AR	- 1.81 (-0.55)	30.31 (5.51)***	1.08 (0.35)

PANEL B: Two Year Analyst Coverage

		Mode of Acquisition		
Method of Payment	Statistic	Mergers	Tender Offers	All Acquisitions
Stock	1. Sample size	178	6	185
	2. NY decile 3yr AR	- 3.77 (-0.89)	23.34 (2.34)*	- 2.79 (-0.68)
Cash	1. Sample size	62	20	82
	2. NY decile 3yr AR	5.68 (0.86)	23.54 (4.18)***	11.46 (2.13)**
Mixed	1. Sample size	25	2	27
	2. NY decile 3yr AR	20.42 (2.86)***	51.69 (3.11)	22.27 (3.32)***
Other	1. Sample size	21	1	22
	2. NY decile 3yr AR	- 14.91 (-0.91)	38.76 (n/a)	- 12.47 (-0.78)
All	1. Sample size	286	29	315
	2. NY decile 3yr AR	- 0.42 (-0.13)	29.76 (5.57)***	2.44 (0.79)

*** Significance at 1% level (two-tailed test)
** Significance at 5% level (two-tailed test)
* Significance at 10% level (two-tailed test)

Table 9

Acquirer Returns Sorted by the Mode of Acquisition and Method of Payment for All Non- I/B/E/S-Covered Firms, 1980-1995

This table includes the subsets of Non-I/B/E/S- Covered Firms from the overall 502 U.S operating firms delisted from the Center for Research in Security Prices (CRSP) tapes due to an acquisition between 1980-1995.This subset of firms satisfied the following criteria: (1) The acquiring firm must have been listed on CRSP on the takeover date and have had a continuous return series for 36 months beginning the months following the target de-listing month; (2) Each firm must not have satisfied the definition of 'analyst coverage' (see ch4.3.2) (3) Information on the method of financing and mode of acquisition must have been available from either the SDC Platinum database or external sources; (3) The mode of acquisition was not ambiguous. Starting the month following the target de-listing date, abnormal returns were calculated for up to three years following the acquisition. Numbers in parentheses represent test statistics.

PANEL A: Non-I/B/E/S - One Year Analyst Coverage

		Mode of Acquisition		
Method of Payment	Statistic	Mergers	Tender Offers	All Acquisitions
Stock	1. Sample size	85	5	90
	2. NY decile 3yr AR	- 19.32 (-2.97)***	- 3.67 (-0.23)	- 19.33 (-3.11)***
Cash	1. Sample size	23	3	26
	2. NY decile 3yr AR	- 10.45 (-0.63)	- 42.35 (-1.32)	- 10.77 (-0.70)
Mixed	1. Sample size	27	0	27
	2. NY decile 3yr AR	- 31.02 (-1.97)*		- 31.02 (-1.97)*
Other	1. Sample size	4	0	4
	2. NY decile 3yr AR	- 38.08 (-0.67)		- 38.08 (-0.68)
All	1. Sample size	139	8	147
	2. NY decile 3yr AR	- 20.67 (-3.51)***	- 18.18 (-1.15)	- 20.53 (-3.66)***

PANEL B: Non-I/B/E/S - Two Year Analyst Coverage

		Mode of Acquisition		
Method of Payment	Statistic	Mergers	Tender Offers	All Acquisitions
Stock	1. Sample size	90	5	95
	2. NY decile 3yr AR	- 19.08 (-2.93)***	- 26.07 (-1.11)	- 18.61 (-2.97)***
Cash	1. Sample size	26	3	29
	2. NY decile 3yr AR	- 15.19 (-0.98)	12.38 (0.40)	- 17.20 (-1.27)
Mixed	1. Sample size	26	0	26
	2. NY decile 3yr AR	- 38.78 (-2.52)**		- 38.78 (-2.55)**
Other	1. Sample size	5	0	5
	2. NY decile 3yr AR	- 32.44 (-0.73)		- 32.44 (-0.73)
All	1. Sample size	147	8	155
	2. NY decile 3yr AR	- 22.33 (-3.92)***	- 22.74 (-1.30)	- 22.35 (-4.07)***

*** Significance at 1% level (two-tailed test)
** Significance at 5% level (two-tailed test)
* Significance at 10% level (two-tailed test)