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Short-run reaction to news announcements: UK evidence

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Abstract:

In this paper we aim to investigate the behaviour of returns around corporate news announcements. The motivation of the paper is that neither the broad classification of news into "good" and "bad" in many previous studies, nor the focus on only one news announcement type such as earnings announcements, allows us to determine whether returns patterns are in general consistent with efficient markets explanations or behavioural finance models. We study a unique dataset of more than 8,000 news announcements collected for 100 UK companies over a period of 10 years. We compute both daily and cumulative abnormal returns over a 27 day event window to enable the observation not only of event day returns reactions but also pre- and post-event day returns. The results reveal that corporate events convey important economic information to investors. One interesting implication of this is an aggregated holistic approach towards firm events may not be appropriate. Some of the evidence found in this paper is not consistent with the efficient market expectations. Asymmetric reaction, sluggishness, over and under-reaction, and leakage are found in many types of news announcements.

Short-run reaction to news announcements: UK evidence

1 Introduction

This paper investigates the behaviour of returns around news announcements for UK quoted companies. More specifically we test the hypothesis that, on average, company news announcements have no impact on the behaviour of stock returns using an event study approach. There is surprisingly little consideration in the existing literature of the topic of very short term returns reaction to corporate news announcements. Because the vast majority of empirical research focuses on the long run behaviour of price reaction, many questions on short term reaction remain largely unanswered. Some of these include the institutional economics of key agents responding to the release of new company information; whether asymmetric trading responses to "good" and "bad" news exist; whether investors discriminate between the different types of news; and whether there are post-event continuations or reversals.

The efficient market hypothesis (EMH) states that stock prices fully reflect all publicly available information, and that no information or analysis can provide investors with the opportunity to outperform the market. As a result, any news announcement concerning a company is rapidly subsumed within its stock price, and announcements will on average not affect stock prices beyond a very short period of time. The EMH holds that individual agents act rationally and therefore correctly interpret all available information, and so we should not observe a series of abnormal returns following the publication of company news. However, if we were to observe a returns drift and/or a reversal pattern after a news announcement then proponents

of the EMH explain these regularities away as nothing more than random disturbances from efficient prices. An alternative explanation is provided by proponents of behavioural finance, who instead point to the presence of systematic deviations of returns from expected prices. Are investors therefore rational as EMH predicts, or are they driven by heuristic bias? Here again, most of the empirical work has been undertaken on long run patterns. While it is interesting to assess asset price behaviour in the long run, the short term behaviour is no less important. If anything, market efficiency is about instantaneous adjustment of prices to new and random information. So, by simple aggregation argument, if there is exactly zero abnormal effect in the short term, there will be exactly zero abnormal effect in any longer term. True, there is a possibility that short term abnormal effects are too small to be detected statistically. But this limitation should drive research towards improving statistical methodologies rather than dropping the more interesting short term in favour of the long term. This is exactly the approach we adopt. We use a more appropriate econometric methodology that provides a more accurate inference. We are able, therefore, to study a relatively short event window which includes pre-event and post-event days. Arguably, given the frequent release of company, industry and country-specific news, a long event window will be increasingly susceptible to news events other than those included in the sample. Overlapping of news announcement may also be problematic in long even windows. The relatively short 27 day window should therefore mitigate these effects. The inclusion of pre-event and post-event returns in the event window enables potential information leakage prior to news events as well as possible post-event drift.

We use a unique data set which spans a 10 year period for 100 UK quoted companies. For the 10 year period, every single news item on these companies was

collected on a daily basis. These company news announcements were then classified into 30 different types. This approach has two advantages. First, it enables a detailed examination of each news type rather than a more simplistic aggregate study of 'good' and 'bad' news. For example, Äijö (2008) classifies macroeconomic announcements into positive and negative and is therefore only able to assess the unconditional effect of information. Our approach allows for more specific conditioning, and we are therefore able to discriminate between various types of news within the same group of, say, positive news. Second, most studies focus only on one or a few types of news. For example, Ryan and Taffler (2006) look at the impact of analyst forecast revisions, Donnelly (2008) investigates the impact of negative press comments, and Otchere and Ross (2002) study the buyback announcement effect. This seems to be driven both by the need to increase the number of test firms, the ease of data collection, and the low cost of obtaining such data. The problem with these approaches is that the conclusions are dependent on the specific type of news studied. Conclusions emanating from such studies are hardly generaliseable to the whole information set. Our approach, however, enables us to look into the whole set of available information. We are able to look both at the aggregate and disaggregate behaviour of all types of news. In particular, we are able to test Fama's (1998) argument that over and under-reaction findings are consistent with efficient markets. Since under-reaction findings are as common as over-reaction findings, these so called anomalies are simply "chance results" (p.304).

Previous tests have encountered intrinsic difficulty in addressing this argument. The reason is simple: you cannot formally test different and unrelated samples. Our data, on the other hand, enable testing across all available news types because they are from the same sample.

One important feature of this study is that reaction to news is considered at the firm level. Analysing the reaction of an aggregate index misses crucial firm level behaviour. Studies like Nikkinen and Sahlström (2004) do offer some insight into the market reaction to a collection of news items, but they are only applicable to the index and may therefore be hard to replicate when a profitable anomaly is found. For example, one might find no over-reaction in the index, but that could be due to half the stocks under-reacting while the other half are over-reacting, thereby cancelling the effect of the first half. If such an effect exists, say because of an industry or size effect, there would indeed be profitable strategies that would short the over-reacting stocks and long the under-reacting stocks. An index based analysis would miss such an opportunity.

The remainder of the paper is organised as follows. The event study approach is explained in Section 2. Section 3 briefly outlines the data collection and the econometric methodology. The fourth section provides a detailed discussion of the results on each type of news, which are grouped into six categories for convenience. The last section discusses the implications of the results for market efficiency and concludes.

2 The event study approach

To test the central hypothesis of this paper, that, on average, company news announcements have no abnormal impact on the behaviour of stock returns, we employ an event study approach with a 27 day event window. We study the behaviour of estimated regression residuals for daily abnormal returns (ARs) and cumulative abnormal returns (CARs) over 25 trading days. Consistent with Fama, Fisher, Jensen, and Roll (1969), ARs are daily average returns deviations of

securities with news announcements from their normal relationship with the market, whereas CARs are the cumulative average returns effects of an announcement.

In this study, time is measured in terms of the number of trading days. The 27 trading day window consists of five trading days before the event, two days for the event 'day', and 20 days thereafter. The event day for a given news announcement is defined as day zero (t=0). Note that the time subscript refers to event-time rather than calendar-time. Importantly, the event date includes both the announcement day and the day after. This is to address the fact that announcements are sometimes issued after trading hours or towards the end of a trading day. In addition to the 27 day event window, we use a further 50 day pre-event period to estimate the model. This gives a total of 76 day-observations for each estimation. Specifically, for an announcement that is made at time t, the estimation window will be t-55 to t+21, while abnormal returns will be estimated for t-5 to t+21.

We group our 30 news announcement types into six categories: profit announcements; corporate restructuring; market sentiment; growth and investment; dividends and financing; and miscellaneous news. Whilst any grouping will necessarily be imperfect, the categories chosen provide for a discussion of news types which demonstrates some commonality of both nature and effect. Testing the no-abnormal return hypothesis across a selection of different corporate announcements helps determine whether there is a common behavioural explanation for the anomalous return pattern following the news (Kadiyala and Rau, 2004).

The result tables are presented in a common three column format for each news type: the first shows the average abnormal return (AAR) for a given day; the second gives the t-statistic for that particular AAR; and the third gives the average

cumulative abnormal return (ACAR), the t-statistics for which are presented at the bottom of each table.

One difficulty with presenting a study of this nature is the large number of t-tests required: 28 tests for each of the 30 news types. Further, given the number of tests, the study is susceptible to data mining biases. We know, for example, that at the 5% level, one in 20 tests might be significant by chance alone, even when a test is well specified. To counter this limitation, we take two actions: firstly, we employ only conservative levels of significance, that is, the 5% and 1% levels; secondly, we consider incidences of only one significant result in 20 (at the 5% level) to be the result of data mining, and thereby interpret our results accordingly.

3 Data and methodology

Because we are collecting a large number of announcements, resource limitation dictated that we restrict our sample of firms to 100. These firms were selected as follows. The list of all companies that traded in the London Stock Exchange between 1992 and 2002 was divided into three size groups. We then randomly drew 33 companies from the large size group, 33 from the medium size group and 34 from the small size group. The firms were then tracked for every news item that was disclosed via Bloomberg between July 1992 and December 2002. This gave a total of 8,155 news announcements. These were then categorised into 30 different types of announcement.

While there is a variety of techniques with which one can estimate abnormal returns, in this paper we adopt the dummy variable approach proposed by Thompson (1985) and Salinger (1992). The model for risk adjustment is the standard Capital Asset Pricing Model (CAPM). We use the market model to obtain abnormal returns.

$$R_{it} - r_{ft} = \gamma_i + \beta_i \left(R_{mt} - r_{ft} \right) + \varepsilon_{it} \quad (1)$$

where $R_{it} - r_{ft}$ is the actual return on asset i in excess of risk-free rate at time t, γ_i is the intercept or a constant of the regression line, β_i is the market beta coefficient for security i, assumed stationary conditional on the risk-free return, $R_{mt} - r_{ft}$ is the market return in excess of the risk-free rate at time t, and ε_{it} is a zero mean, independent, disturbance term in period t for security i.

Abnormal returns are obtained as $AR_{it} = (R_{it} - r_{ft}) - \hat{\beta}_i \left(R_{mt} - r_{ft} \right)$ where the beta is estimated from the market model (1). One possible concern in using the market model for small firms is the non-trading bias. Clare et al. (2002), for example, found that non-trading in the London Stock Exchange is substantial (see also Foerster and Keim (1993) for evidence on US market). However, while non-trading bias is real, it only impacts the estimation of systematic risk. It is therefore a major concern for those directly interested in estimating the slope but not the intercept. One common solution to this problem is to calculate abnormal returns as a simple difference between a stock's return and the market return. Another solution is to ignore the market return altogether and use stock returns as abnormal returns. However, both of these solutions would entail the assumption that all stocks have a beta of either one or zero. This is likely to be unrealistic. Furthermore, by imposing either constraints (i.e. unit or zero beta), the intercept will generally be biased. It will only be unbiased and efficient if one of these constraints is true. On the other hand, it is well known in econometrics that adding an irrelevant variable would lead to an unbiased though inefficient intercept. As our concern is the intercept rather than the slope, a market model is a preferred option as it is more likely to lead to unbiased abnormal returns than a zero or unit beta based abnormal return. Moreover, it is often argued that short

term returns are likely to have an expected value of zero (Fama, 1998). In such a case, the model used to compute abnormal returns becomes irrelevant. In fact, Campbell, Lo and Mackinlay (1997, pp.154-156) contend that there is little difference between using a zero beta model, a market model or a multifactor model.

The standard procedure in event studies is to first compute abnormal returns, AR_{it}, using an assumed model for normal returns. Then, in the second pass, abnormal returns are averaged or cumulated and tested. However, this method may yield spurious results (Salinger, 1992). Instead, we adopt a dummy variable approach.

The primary advantage of the dummy variable approach is that both prediction errors and test statistics are conveniently obtained from any standard regression package. Moreover, Salinger shows that the standard errors obtained from averaging individually estimated abnormal returns are incorrect. The reason is that such an approach ignores the intertemporal correlation of individually estimated abnormal returns. The two step approach also ignores the contemporaneous correlation of estimated cumulative abnormal returns.

The dummy approach, however, provides correct standard errors. Unlike the two-step procedures, the dummy approach estimates both the model and abnormal returns in a single step. Thus, not only do we obtain the correct standard error for each individual abnormal return, but we also obtain the correct estimate of the covariance between successive abnormal returns. This is crucial in obtaining the correct standard error of the average cumulative abnormal return.

The dummy model is simply obtained by appending a vector of dummy variables to the right-hand side of the conventional equilibrium model given in equation (1). Thus, for each news announcement, *i*, abnormal returns are estimated from the following model:

$$R_{it} - r_{ft} = \gamma_i + \beta_i \left(R_{mt} - r_{ft} \right) + \sum_{\tau=1}^{27} \alpha_{i\tau} D_{i,\tau,t} + \varepsilon_{it} \quad (2)$$

where $\alpha_{i\tau}$ is the abnormal return for period τ, and $D_{i,\tau,t}$ is a dummy variable that takes a value of 1 for period τ and zero otherwise. For example, $D_{i,1,t}$ equals 1 five days before the news announcement, $D_{i,6,t}$ equals 1 on the first event day, and $D_{i,27,t}$ equals 1 on the 20th day of the post-event window. In this way, abnormal returns are distinguished from the residuals and contain the correct standard errors. Because the event window consists of two event days, the abnormal returns on the day of announcement and the following day ($\tau = 6,7$) are then averaged to get a single value for event day abnormal returns. This reduces the number of event 'days' to 26.

Testing abnormal returns

Suppose there are N news items for each announcement category. Then, 26×N abnormal returns ($\hat{\alpha}_{i\tau}$, $i = 1,\cdots,N$; $\tau = 1,\cdots,26$) are obtained. A given abnormal return, $\hat{\alpha}_{i\tau}$, has variance $\hat{\sigma}_{i\tau}^2$. Thus, for each event day, τ, the average abnormal return, AAR_τ, its variance, and the t-statistic are given, respectively, by

$$AAR_\tau = \overline{\alpha}_\tau = \frac{1}{N} \sum_{i=1}^{N} \hat{\alpha}_{i\tau}$$

$$Var(AAR_\tau) = \frac{1}{N^2} \sum_{i=1}^{N} \hat{\sigma}_{i\tau}^2$$

$$t_\tau = \frac{AAR_\tau}{SD(AAR_\tau)}$$

The t-statistic tests the null hypothesis, H_0, whether, on average, the event has no impact on the behaviour of returns. The above t-statistic assumes that abnormal

returns are independent in the cross-section. This is not unrealistic since news announcements take place randomly.

Testing cumulative abnormal returns

On any given event day, cumulative abnormal return before or after the announcement is obtained by accumulating the estimates of $\alpha_{i\tau}$. Let $\hat{\alpha}_i = (\hat{\alpha}_{i1} \quad \hat{\alpha}_{i2} \quad \cdots \quad \hat{\alpha}_{i27})'$ denote the vector of estimated abnormal returns, and let $\hat{V}_i$ denote the estimated variance covariance matrix of these estimates. Define a 27 element vector δ having ones in pre- or post-event window and zero elsewhere. For example, if we wish to evaluate cumulative abnormal returns on the five-day pre-event period, only the first five elements of δ are set to one. For the 20 days post-event period, only the last 20 elements are set to one.

The estimated cumulative abnormal return for any arbitrary window in an event *i* and the variance of this estimate are given by

$$C\hat{A}R_i(\delta) = \delta' \hat{\alpha}_i$$

$$\hat{\sigma}_i^2(\delta) = \delta' \hat{V}_i \delta$$

To test whether the cumulative abnormal event is, on average, significant across all *N* events, a simple t-test based on the average values is performed. Specifically,

$$t(\delta) = \frac{ACAR(\delta)}{\overline{\sigma}(\delta)}$$

where

$$ACAR(\delta) = \frac{1}{N} \sum_{i=1}^{N} C\hat{A}R_i(\delta)$$

$$\bar{\sigma}^2(\delta) = \frac{1}{N^2}\sum_{i=1}^{N}\hat{\sigma}_i^2(\delta)$$

If the estimation window is large, the statistic $t(\delta)$ is well approximated by the standard normal. Again, it is reasonable to assume cross-sectional independence since the announcements occur randomly both across time and across firms.

4 Results

In this section we examine the results of the event study tests by testing the event day returns reaction, followed by pre-event and post-events returns patterns. When discussing the results, the term "investors" is used to signify all categories of market participants. The results are summarised in Tables 1 to 12. To save space, the tables contain abnormal returns for five days before and after the event regardless of the significance of those abnormal returns. Abnormal returns beyond the 5 day window are only shown when they are statistically significant.

4.1 Announcements

The first news category, profit announcements, includes final and interim profit announcements, and all other ad-hoc announcements. Tables 1 and 2 show the abnormal returns from final and interim profit announcements, including profit up, profit down and loss. A number of interesting results are evident.

[Insert Tables 1 and 2 here]

Firstly, all of the news types for both interim and final results evidence a highly significant returns reaction on the event day, except for final profit down. This exception might be explained by investors using the interim announcement to predict the outcome of the final announcement (Pincus, 1983). Indeed, Shores (1990)

suggests that interim information can reduce the absolute value of the market's unexpected earnings at the final earnings announcement date.

Secondly, the significant positive returns reaction to a final profit up (1.34%) greatly exceeds the insignificant positive returns reaction to final profit down (0.23%), but is almost exactly mirrored by the significant negative returns reaction to a final loss (-1.40%). The insignificant reaction to final profit down, might also be explained by the mixed signal effect: bad news (profit is down) is partly offset by good news (there is some profit after all). With regard to interim event day reactions, the profit up produces a significant but smaller than final positive reaction (0.79%) whereas the loss produces a significant negative reaction (-1.36%) of similar size to the final announcement. Interestingly, the interim profit down produces a significant negative reaction (-1.04%) in contrast to the final profit down. Evidently, once investors observe an interim profit down signal, they assume that it is unlikely that the profit trend will be reversed before the final announcement date: investors are less surprised by final profits down than by other profit announcements.

Thirdly, in the pre-event period, only interim and final profit up announcements appear to be anticipated by investors. The ACARs for the pre-announcement interval are significant at the 5% level for both profit announcements, with cumulative pre-event effects of 0.41% for the final profit up and 0.44% for interim profit up. Clearly, good news are leaked to the market whereas mixed news (profit down) and bad news (loss) are not. One explanation is that some clue of the financial report outcome has been received by the market (Morse, 1981). Alternatively, it might be that: sources of information other than the annual income statement cause investors to adjust stock prices in advance (Ball and Brown, 1968); the interim report pre-empts insider trading by disseminating information which is otherwise only subjectively held

(Opong, 1995); or the most surprising important announcements are released to the public prior to the official announcement, perhaps even by conveying a hidden message to the press and analysts (Skinner, 1994; Elton and Gruber, 1995). Our results therefore provide evidence against the strong form of the EMH.

Fourthly, in the post-event period there is a significant reversal pattern (significant ACARs at the 1% level) for final and interim profit up and for final loss. The ACAR for the 20 day post event window is -1.57% for the interim profit up and -1.95% for the final profit up, whilst for the final loss the ACAR is 5.41%. Thus we observe initial investor over-reaction followed by a correction, all within a short-term window. Contrary to the EMH, which predicts an equal balance of over and under-reaction across news events, the significant post-event reactions are all over-reactions followed by reversal corrections, the large part of these typically occurring within the first five days, consistent with the findings of Daniel, Hirshleifer, and Subrahmayam (1998).

The abnormal return results for the ad-hoc profit announcements, which are often qualitative in nature and occur irregularly, are given in Table 3. The patterns of returns for positive and negative announcements differ greatly from the more formal financial statement related announcements.

[Insert Table 3 here]

Firstly, there is a marked reaction asymmetry in that the returns reaction to negative news is greater (-4.78%) than the reaction to positive news (0.87%), whilst both reactions are highly significant. One explanation may be that, cognisant of litigation threats and the need for investor transparency, company directors would rather under-emphasise good news and over-emphasise bad news. This result is consistent with the findings of Skinner (1994) who noted that good news is released

by companies more frequently than bad news as a means of addressing short-term mispricing, with bad news being released more discretely as a means of avoiding large negative earnings surprises. Indeed, Beaver (1968) notes that profit warnings diminish in their impact with the frequency of announcements. Secondly, there is little evidence of pre-event leakage as the ACAR in both cases is insignificant, even though there is an isolated significant ARR in each case. Thirdly, and somewhat unexpectedly, we do not observe post-event correction to the sizeable reaction to negative profit news, whereas we do observe a significant correction at the 1% level when a positive profit announcement is made (with a ACAR of -2.08%). Perhaps this over-reaction is again symptomatic of the greater frequency of positive profit news announcements and their reduced true economic impact as a result.

4.2 Corporate restructuring

The first news announcement type in this category, corporate mergers, includes mergers with the company as bidder, mergers with the company as target, and terminated merger negotiations. Table 4 shows the abnormal returns patterns associated with these news announcements. We begin here with a comparison of the abnormal returns associated with merger deal announcements.

[Insert Table 4 here]

Firstly, regardless of whether bidder or target, there is a highly significant positive returns reaction on the event day, though the reaction has a greater magnitude for the target firm (2.91%) than the bidder firm (0.32%). The result that target shareholders receive economically larger wealth gains is consistent with Mandelker (1974), Asquith (1983), and Cheung and Shum (1993). Roll (1986) suggests that the implicit overpayment on the target's shares is motivated by managerial hubris, as their

overconfidence leads to an inaccurate estimation of both their ability and the target's economic value. Shefrin (2002) argues that bidder shareholders invariably suffer from the "winner's curse", and further Burkart (1995) suggests that this curse will still occur, even if managers are free from individual biases due to the competitive situation they find themselves in or even their partial ownership of the target firm.

Secondly, in the pre-event period, there is significant leakage in bidder returns, but not in target returns. The ACAR for the pre-announcement interval are significant at the 1% level for bidder returns, with cumulative pre-event effects of 0.51%. Leakage is particularly marked in the last two days before announcement (0.14% and 0.19%, respectively). Halpern (1982) argued that such leakage may be the result of insider trading or the signal provided by previous successful tender offers, thereby increasing the likelihood of future merger plans. Alternatively, Seyhun (1990) argues that such leakage is a result of hubris bias and thus overconfidence, leading to a systematic overestimation of merger synergy gains, a reluctance to issue new equity, and a tendency for repurchases leading up to the announcement date. For the target firm, day -3 returns are significant at the 1% level, but not the ACAR for the overall pre-announcement period. Further evidence supporting the no-leakage hypothesis is provided by the large negative return the day before announcement, which is significant at the 10% level.

Thirdly, in the post-event period, the bidder company's abnormal returns tend to drift upwards whilst the target's drift downwards. Whilst days 8 and 9 evidence significant abnormal returns at the 1% level, for the bidder the 20 day ACAR is insignificant in this case and in the case of the target. Thus, there is no evidence of significant post-announcement correction, contrary to the experimental findings of Wansley, Roenfeldt, and Cooley (1983).

Table 4 shows the abnormal returns associated with news of a terminated merger negotiation. Clearly, the results show little abnormal return impact of this news, either on the event day or in anticipation or following the news. This result is perhaps surprising given the at times significant costs associated with a terminated negotiation, though termination fee provisions may well alleviate these costs in practice (Officer, 2003; Bates and Lemmon, 2003).

The second news announcement type in this category is restructuring, and includes the announcement of a joint venture/strategic alliance, a company reorganisation, and the appointment of an investment banker. Table 5 shows the abnormal returns patterns associated with these news announcements.

[Insert Table 5 here]

Joint ventures and strategic alliances differ from mergers in the respect that the parental management remains intact and independent from the other party (Chan, Kensinger, Keown, and Martin, 1997). We should expect the market to reward such ventures where they are perceived to deliver valuable investment opportunities and punish them otherwise (Mohanram and Nanda, 1998; Chen, Ho, Lee, and Yeo, 2000). Further, shareholders of the smaller party tend to gain more than those of the bigger party (McConnell and Nantell, 1985; Mohanram and Nanda, 1998). Restructuring, on the other hand, encompasses any news regarding the revision of the firm's business structure, including financial or asset restructuring, refocusing, relocation, operating level reduction, spin-offs, and so on. Here, it is the managerial motivation and associated prospects of the action which are important, rather than the action itself (Chan, Gau, and Wang, 1995). Whilst managers would like to signal value creation as their motivation (Pike and Neale, 2003), where intentions are unclear we might expect a negative price response (Khurana and Lippincott, 2000).

Table 5 reveals that there is little market reaction to news of joint ventures/strategic alliances or to company reorganisation. Event day abnormal returns are small and insignificant at 0.23% and 0.00%, respectively. There are significant abnormal returns at the 5% level on day 11 for the former and day 10 for the latter, though we can ignore there as isolated cases. Either markets do not appear to value the synergistic efficiency or other gains at the news announcement date, or perhaps consider these to be difficult to quantify at the outset. The result contrasts greatly with the earlier results for mergers. Perhaps markets consider that a certain proportion of joint ventures/strategic alliances are driven by managerial misalignment (Mohanram and Nanda, 1998), or the lack of synergy gains or the focus-diminishing nature of many vertical or conglomerate ventures (Johnson and Houston, 2000). The lack of small but positive market reaction to company reorganization also runs counter to expectations (Burch and Nanda, 2003; Chemmanur and Yan, 2004; Veld and Veld-Merkoulova, 2004).

It is possible that a finer division of news events within each category would lead to more significant results, particularly if analysed in conjunction with further information concerning underlying firm performance. For example, joint ventures/strategic alliances and reorganisation in firms which are performing well may give rise to a positive market reaction whereas the same strategies for firms performing badly may give rise to a negative reaction. In this study we observe only the average reaction across all firms, which may give rise to the zero or near zero net reaction.

Table 5 shows the significant positive abnormal returns reaction to the appointment of an investment banker. On the announcement day, there is a returns reaction of 0.71%, significant at the 1% level. This is perhaps a surprising result given the

routine nature of the news. Whilst we cannot draw upon previous studies in this area, we know that markets react positively to the news of accounting and finance officer appointments (Geiger, Lennox, and North, 2008), and the appointment of prestigious investment bankers in initial public offerings (Michaely and Shaw, 1994; Carter, Dark, and Singh, 1998). In our study, pre-event and post-event reactions are insignificant, except for a single day 20 abnormal return which is significant at the 1% level.

The final news type in the corporate restructuring category that we examine here is divestment or contraction. Further, we distinguish here between internal divestment, where the firm reduces its productive asset base through closing divisions or plants, and external divestment, where the firm reduces its holdings of other firm's financial assets. In recent decades western economies have experienced a reduction in diversification activity as firms focus more on core activities – economies of scope were seen as no longer worth pursuing (Comment and Jarrell, 1995; John and Ofek, 1995). Such economies entered into a period of revenue-focusing (Chalos and Chen, 2002). If the market perceives that a divestment will be favourable in that it will generate tangible cost savings then it will react positively, whereas if the divestment is expected to merely lead to an unfavourable reduction in productive capacity then it will react negatively. Statman and Sepe (1989) propose a positive market reaction to the release of funds for alternative projects with better prospects or for purposes of cost reduction. Table 6 enables the comparison of the abnormal returns associated with each news type.

[Insert Table 6 here]

There is a positive abnormal returns response of 0.41% to internal divestment which is significant at the 1% level, whereas the response to external divestment is

insignificant. Thus, the market typically views internal divestment positively, assuming that firm managers have arrived at the divestment decision by means of an objective abandonment option NPV analysis. This result contrasts with the findings of Blackwell, Marr, and Spivey (1990) and Gombola and Tsetsekos (1992), where a negative market reaction was found, as markets observe a negative signal often associated with reduced demand for the firm's products, declining profitability, and treat the news as symptomatic of wider firm concerns.

The lack of market reaction to the divestment of financial assets, external divestment, is entirely expected as firms routinely increase or decrease external investments as their working capital requirements change. Indeed, this finding is consistent with the assertion of Jain (1985) and John and Ofek (1995), that after external divestment the firm's operations are unaffected. With regard to both internal and external divestment, neither pre-event nor post-event ACARs prove to be significant.

4.3 Market sentiment

The third news category, market sentiment includes investment analyst positive (buy), negative (sell) and neutral (hold) recommendations. Such analysts research individual shares and produce reports for their clients such as fund managers. In so doing, they not only provide detailed information on a share, but also information on their sentiment regarding the share's intrinsic value in relation to the current market price (Francis and Soffer, 1997). If markets are efficient, then all publicly available information relevant to intrinsic share value should at all times be subsumed within price. Thus analyst recommendations should not give rise to abnormal returns patterns. However, we know that in practice investment banks maintain expensive

security analysis teams and also that investors consider analyst advice an important information source when making their investment decisions (Hirst, Koonce, and Simko, 1995). Ivkovic and Jegadeesh (2004) suggest that the value of analyst recommendations may lie either in their special skill at analysing available information or in their ability to discover insider information. Table 7 shows the abnormal returns associated with each analyst recommendation announcement.

[Insert Table 7 here]

On the event day, we observe significant returns reactions at the 1% level for both positive and negative recommendations with abnormal returns of 0.93% and -0.52% respectively, but an insignificant response to a neutral recommendation. These results clearly suggest that the market is far from efficient in its reaction to recommendation news.

In the pre-event period, we observe a significant negative ACAR at the 1% level for negative recommendations, with significant negative abnormal returns in the two days leading up to announcement. Therefore there is significant leakage associated with a negative recommendation. With regard to positive recommendations there is a significant positive abnormal return one day before the event at the 1% level, though the pre-event ACAR is not significant. There is thus evidence of significant leakage in respect of both positive and negative recommendation news. We observe no significant leakage for a neutral recommendation.

In the post-event period, whilst there is no mis-reaction after the event day for the positive recommendation news, for the negative recommendation we observe an abnormal return of -0.37% for the day after the announcement which is significant at the 1% level, consistent at least in part with the post earnings announcement drift

anomaly established by Bernard and Thomas (1989, 1990). There is thus significant under-reaction to negative recommendations which is corrected after the event.

The results taken as a whole reveal an interesting abnormal returns pattern. Consistent with Skinner (1994) and Ryan and Taffler (2006), negative news generates a more pronounced and enduring price effect than positive news. Indeed, in our study we observe a four day cumulative abnormal returns of -2.13% associated with the negative recommendation, whereas there is only a two day positive abnormal returns totalling 1.28% associated with the positive news. Given that investment bankers rely on commissions from their large corporate clients, they are more likely to give buy recommendations than sell recommendations on the shares of their clients. Indeed, Shefrin (2002) found that in 2000, more than 70% of all US analyst recommendations were “buys”, Ryan and Taffler (2006) find that the sell-to-buy recommendation ratio is even higher for the UK, and Shiller (2005) also notes that analyst recommendations have been subject to some inflation in recent years. As a result, sell recommendations are more “visible” (Shefrin, 2002) and investors are likely to react to them in a more pronounced manner.

We should also expect neutral recommendations to exert a significant negative influence on abnormal returns. However, whilst the reaction here is negative, it is not significant.

In sum, the returns reaction to analyst recommendations is inconsistent with the EMH in that analyst recommendations contain economically valuable information, there is pre-event leakage for both positive and negative recommendations, and post-event under-reaction for negative recommendations. One important caveat here is that there may be a lag between an analyst making a recommendation and that news being recorded on Bloomberg. This could explain the significant abnormal returns

reactions for positive and negative recommendations the day before the event day in each case.

4.4 Growth and investment

The fourth news category of growth and investment includes both internal and external expansion, and new product (or service) and new customer (or contract). As discussed in the corporate restructuring category, a firm can invest or divest either internally, by increasing or reducing real productive capacity; or externally, by increasing or decreasing their holdings of the financial assets of other companies. Internal investment is likely to be well regarded by the market, except where it involves unrelated diversification (Rumelt, 1982; Comment and Jarrell, 1995). Table 8 shows the abnormal returns associated with internal and external expansion news.

[Insert Table 8 here]

Clearly, both internal and external expansions produce a significant positive abnormal returns response on the event day. Internal expansion news generates a 0.49% response whereas external expansion news generates a smaller 0.29% response, both of which are significant at the 1% level. The results are somewhat surprising as whilst we might expect a significant market response to internal investment news, external investment may be merely the result of short-term working capital requirements (transitory excess liquidity) and therefore should not have a significant returns impact as the firm's productive capacity remains unchanged.

In the pre-event period, we observe some weak evidence of leakage in relation to internal investment news, with five successive positive abnormal return days leading up to the event day. Whilst these abnormal returns are individually insignificant, the

ACAR is significant at the 5% level. In the post-event period, there are positive abnormal returns on day 3 for each news type. However, there is no apparent explanation for this and neither post-event ACAR is significant.

In sum, there is some evidence of pre-event leakage with investment news. Perhaps 'more informed investors' trade the share intensively in anticipation of this important corporate disclosure, consistent with John and Mishra (1990), Giammarino, Heinkel, and Hollifield (1994), and Del Brio, Perote, and Pindado (2003).

The second news type within this category is the announcement of new product (or service) and new customer (or contract). A well-accepted means of achieving corporate competitiveness is to set in place continual innovation strategies (Chan, Martin and Kensinger, 1990). Table 9 gives the abnormal returns from these two news types.

[Insert Table 9 here]

The market reacts positively to each news type. The returns reactions are 0.76% for a new product (service) and 0.86% for a new customer (contract), both of which are significant at the 1% level. It is perhaps not surprising that markets react favourably to the news of potentially higher future cash flow streams, as these feed directly into intrinsic share value.

In the pre-event period, there is some abnormal returns volatility in the case of new customer (contract) news, with significant abnormal returns at the 1% for days -3 and -1. However, neither pre-event ACAR is significant. One explanation is that whilst news of a new product or service is highly confidential and therefore leakage is far less likely, news of a new customer or contract deal is more likely to be in the public domain. Further, until that deal is agreed, the uncertainty may give rise to abnormal

return volatility, in this case swinging between negative and positive abnormal returns. In the post-event period, ACARs are insignificant for both news types.

In sum, the market regards announcements of new product/service or new customer/contract as positive, giving rise to a potentially higher future stream of cash flows to the firm and its investors. This information is reflected rapidly in share price, with little evidence of pre-event leakage and no evidence of post-event correction.

Overall, the results for the growth and investment category are broadly consistent with the positive abnormal returns of previous studies such as Woolridge and Snow (1990), Chaney and Devinney (1992), Chan, Gau, and Wang (1995), and Chen et al. (2000).

4.5 Dividends and financing

The fifth category includes dividend announcements and equity financing announcements. Dividend announcements, in turn, are divided into regular dividend announcements and special dividend announcements. However, it is noted that regular dividend announcements here are those which are not announced in conjunction with profit announcements. The signalling hypothesis proposes that managers use dividend payments as a signalling mechanism to communicate private information to help investors to value the prospective earnings of the firm. Markets tend to react positively to dividend information as knowledge of dividends lowers the variability of returns and produces a useful signal regarding subsequent reinvestment policy (Asquith and Mullins, 1983; Sant and Cowan, 1994). Whilst regular dividends represent an implicit commitment to maintain a given payout ratio, special dividends represent a one-off reward distribution and entail no such commitment. Managers will not increase their dividend payout ratio unless future cash flows allow (Petit,

1972; Healy and Palepu, 1988). Whilst special dividends cause a transitory signal about future profitability, regular dividends convey a more permanent signal (Brickley, 1983; Gombola and Liu, 1999; and DeAngelo, DeAngelo, and Skinner, 2000). We should therefore expect both types of dividend signal to give rise to positive market reactions. Table 10 shows the abnormal returns from the two types of dividend announcement.

[Insert Table 10 here]

Interestingly, on the event day, whilst regular dividend and special dividend news gives rise to positive abnormal returns reactions, neither is significant. It is entirely possible that the related economic information content of these announcements has already been subsumed within price following a previous news announcement. With regard to special dividends, DeAngelo et al. (2000) argue that as special dividend announcements have become as predictable as regular dividends over the last 40 years, these news announcements have lost their importance in terms of conveying additional useful information. Neither the pre-event nor the post-event ACARs are significant, and therefore we observe no pre-event leakage or post-event mis-reaction. The market is therefore broadly neutral to these dividend announcements.

Moving on to the equity financing decision, we study both share issues and share repurchases. The information signalling hypothesis suggests that finance managers tend to issue shares when they have a financing requirement and believe the firm's shares to be overvalued, whereas they repurchase shares when they have excess cash and believe their shares to be undervalued (Loughran and Ritter, 1995; Stephens and Weisbach, 1998; Dittmar, 2000; Ikenberry, Lakonishok, and Vermaelen, 2000; Montier, 2004; and Zhang, 2005). Dierkens (1991) argues that new share issues signal unfavourable information about a firm's economic opportunities to the market,

thereby leading to a fall in share price thereafter, whereas repurchasing signals favourable information regarding future performance (Lie, 2005) or signals a takeover defence (Vermaelen, 1984). We should thus expect negative abnormal returns to be associated with a share issue and positive returns associated with a share repurchase announcement. If nothing else, the latter is mechanical as the number of shares is reduced, ceteris paribus. Table 11 shows the abnormal returns associated with share issues and repurchases.

[Insert Table 11]

The event-day response, whilst producing the expected abnormal returns sign, is insignificant for each news type, contrary to the existing literature. Further, although we observe a significant negative abnormal return for share repurchase news at day -1, it is only significant at the 5% level and the sign is contrary to expectations. Interestingly, however, in the case of both share issues and repurchases, there is evidence of significant under-reaction on the event day, as the ACARs in both cases evidence corrections which are significant at the 5% and 1% levels, respectively. For share issues, the initial under-reaction gives rise to subsequent further significant negative correction on days 2, 7 and 9 following the event day. For share repurchases, the initial under-reaction gives rise to subsequent further significant positive corrections on days 2 and 16. Evidently, then, the market reacts relatively slowly to share issues and repurchases, though in the direction expected.

If we compare regular dividend news and share repurchase news announcements, our results suggest that they are not treated by the market as substitute actions. Gelb (2000), Guay and Harford (2000), and Jagannathan, Stephens, and Weisbach (2000) report that firms with large permanent operating cash flows are more likely to issue dividends, whereas firms with large transient non-operating cash flows are more

likely to repurchase their shares. Our results confirm that the former are predictable and therefore contain no additional economic information whereas the latter are less predictable and contain useful economic information. In general, then, dividend announcements contain little news which the market does not already have, whereas changing the equity base of the firm is not immediately, but is certainly after some reflection, a newsworthy event of economic consequence.

4.6 Miscellaneous news

The sixth and final news announcement category collects all news not included in the other categories above into good, bad and ambiguous news types. Whilst we clearly expect miscellaneous good news to produce a positive abnormal returns reaction, and miscellaneous bad news to produce a negative abnormal returns reaction, we do not expect ambiguous news to produce a reaction at all. Table 12 shows the abnormal returns arising from the three news announcement types.

[Insert Table 12 here]

The abnormal returns reaction on the event day is consistent with expectations: miscellaneous good news gives rise to positive returns of 1.41%, whilst miscellaneous bad news gives rise to negative abnormal returns of -0.57%, both of which are significant at the 1% level. Ambiguous news produces an insignificant positive abnormal returns reaction of 0.26% on the event day. Thus, the market clearly acknowledges the economic information content in miscellaneous good and bad news.

In the pre-event period, there is significant evidence of leakage with respect to miscellaneous good news but not miscellaneous bad news. The ACAR for the 5 days leading up to the event day is 1.12% which is significant at the 1% level, with

significant leakage evident in the final two days before announcement. In the post-event period, there is no evidence of mis-reaction for either miscellaneous good or bad news. In terms of miscellaneous ambiguous news, there is a single negative correction on day 13, significant at the 5% level, and the ACAR is significant at the 10% level. There is thus some weak evidence that markets are not well suited to gauging the effect of ambiguous news as 'markets hate uncertainty', leading at times to a small correction at a later date once the likely impact of that news has been analysed more thoroughly.

Far from being efficient, this paper demonstrates that investors react to UK stock exchange listed company news announcements in a manner which is somewhat removed from the expectations of an efficient market. We not only observe significant news leakage, but also frequent subsequent correction consistent with an initial share price over-reaction.

5 Conclusion

This paper sought to investigate the behaviour of returns around news announcements for UK quoted companies, testing 30 different news announcement types over 100 UK companies over a 10 year period. The results provide some insight into the efficiency of markets and enable us to consider whether the EMH or behavioural finance best describe the returns reaction of investors to corporate news announcements. If EMH holds and investors react rationally, stock prices will adjust immediately and correctly (on average) to reflect published information – thus we would observe no abnormal returns before or after the event whereas if behavioural finance theories best explain returns reactions then new information will take time to

disseminate and be reflected in prices and we will see evidence of drift, reversals, and so on.

Firstly, it is clear that corporate events do convey important economic information to investors. The change in equilibrium stock price around and during the announcements supports the contention that investors have modified their expectations of future firm earnings. Further, market participants do not only acknowledge the news, they appear to understand it in that they react more strongly to news with long-term than transitory implications for the firm, and they do not react where the economic implications are ambiguous.

Secondly, the market response to negative news is generally stronger than its response to positive news in that positive news announcements in general do not generate as large and long-lasting abnormal returns effects as negative announcements. The relative frequency of release of positive news observed in our study tends to diminish its effect, consistent with Skinner (1994).

Thirdly, whilst in general investor responses following corporate events were consistent with the existing literature in terms of direction, the initial response evidenced underreaction (and subsequent drift) or overreaction (and subsequent correction) in certain cases.

The results taken as a whole clearly question some of the central propositions of the Efficient Markets Hypothesis and Fama's more recent defence of it in the light of some challenging empirical evidence. It takes time for news information to be incorporated into the price share, so whilst stock prices correctly (on average) reflect published information they do not always do so immediately as suggested by the EMH. Fama (1998) states that anomalies may occur by chance and thus we should expect an equal probability of under- and over-reaction. However, our results show

four significant over-reaction cases and only two cases of significant under-reaction, and 20 per cent of news announcements giving rise to such anomalies. Both the frequency of incidence of anomalies and their mix tends to reject an efficient markets explanation. If markets are efficient in the strong-form then we should not observe a significant reaction to analyst recommendations, whereas we observe significant reactions to both positive and negative recommendations in our study, implying that investors believe they contain valuable economic information. Finally, the incidence of information leakage in a number of news types suggests that markets have mechanisms for the release of private information, again rejecting strong-form efficiency.

If the EMH fails to explain the behaviour of UK investors in response to a wide range of news announcements, what alternative explanations might we explore? The behavioural finance explanations of Daniel et al. (1998) and Barberis, Shleifer and Vishny (1998) provide us with some insights into over-reaction and under-reaction based on investor psychology. However, as they focus on event windows of up to 5 years, they necessarily fail to provide much insight into behaviour over our post-event window of only 20 days. There is, therefore, a interesting venue for research to explore different behavioural explanations in the very short-term, as concepts such as representativeness in over-reaction and conservatism in under-reaction are clearly longer-term phenomena in the existing empirical literature.

Notes

1. For robustness we used both unit and zero beta models to compute abnormal returns. The results were very similar to those obtain by the market model.

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Table 1 Final profit announcement

	Final Profit up				Final Profit Down				Final Loss			
Day	AAR	T-Stat		ACAR	AAR	T-Stat		ACAR	AAR	T-Stat		ACAR
-5	0.05%	0.582		0.05%	-0.07%	-0.377		-0.07%	-0.60%	-1.554		-0.60%
-4	0.06%	0.767		0.11%	0.08%	0.435		0.01%	0.45%	1.151		-0.15%
-3	0.09%	1.091		0.20%	-0.01%	-0.072		0.00%	-0.19%	-0.505		-0.35%
-2	0.10%	1.300		0.30%	0.12%	0.658		0.11%	0.64%	***1.652***		0.29%
-1	0.10%	1.303		0.41%	0.17%	0.973		0.29%	0.59%	1.531		0.88%
0	***1.34%***	***23.347***	**		***0.23%***	***1.845***			***-1.40%***	***-5.081***	**	
1	0.02%	0.193		0.02%	0.24%	1.339		0.24%	0.37%	0.962		0.37%
2	-0.10%	-1.187		-0.08%	0.20%	1.133		0.44%	1.06%	***2.740***	**	1.43%
3	-0.17%	***-2.170***	*	-0.25%	-0.05%	-0.302		0.38%	0.48%	1.251		1.91%
4	-0.10%	-1.193		-0.35%	0.21%	1.169		0.59%	0.68%	***1.770***		2.60%
5	-0.25%	***-3.156***	**	-0.60%	-0.08%	-0.461		0.51%	0.51%	1.336		3.11%
12	-0.21%	***-2.665***	**	-1.32%	-0.08%	-0.457		-0.09%	0.16%	0.421		2.88%
14	-0.21%	***-2.562***	**	-1.62%	-0.24%	-1.364		-0.13%	0.13%	0.342		3.54%
	ACAR	T-Stat			ACAR	T-Stat			ACAR	T-Stat		
	(-1, -5)	***2.170***	*		(-1, -5)	0.699			(-1, -5)	0.983		
	(1, 20)	***-4.636***	**		(1, 20)	-0.288			(1, 20)	***2.678***	**	

Notes: All tables present the price reaction to each announcement. AAR is the Average Abnormal Return, and ACAR is the Average Cumulative Abnormal Return. Averaging was carried out across event firms. The event window extends from five days before the event to 20 days following the news announcement. The event day consists of two trading days. The significance of the t-statistics for the null hypothesis that AAR is zero is indicated by ** and * for the 1% and 5% levels of significance respectively which are also shown in italicized bold. Returns which are significant only at the 10% level are simply shown in italicized bold type alone.

Table 2 Interim profit announcement

	Interim Profit up				Interim Profit Down				Interim Loss			
Day	AAR	T-Stat		ACAR	AAR	T-Stat		ACAR	AAR	T-Stat		ACAR
-5	0.06%	0.705		0.06%	0.08%	0.451		0.08%	0.01%	0.044		0.01%
-4	0.13%	1.547		0.19%	0.04%	0.217		0.12%	0.38%	1.240		0.40%
-3	0.09%	1.022		0.28%	0.09%	0.485		0.20%	-0.01%	-0.048		0.38%
-2	0.01%	0.124		0.29%	0.10%	0.559		0.30%	0.25%	0.810		0.63%
-1	0.16%	***1.842***		0.44%	0.04%	0.231		0.34%	0.24%	0.773		0.86%
0	***0.79%***	***12.983***	**		***-1.04%***	***-8.234***	**		***-1.36%***	***-6.299***	**	
1	-0.04%	-0.425		-0.04%	-0.16%	-0.890		-0.16%	-0.23%	-0.742		-0.23%
2	0.09%	1.078		0.05%	0.01%	0.065		-0.14%	0.14%	0.467		-0.08%
3	-0.24%	***-2.812***	**	-0.18%	-0.09%	-0.521		-0.24%	0.04%	0.136		-0.04%
4	-0.13%	-1.504		-0.31%	0.09%	0.502		-0.15%	0.27%	0.895		0.23%
5	-0.09%	-1.076		-0.40%	0.05%	0.305		-0.09%	0.47%	1.558		0.70%
9	-0.17%	***-1.967***	*	-0.93%	0.01%	0.070		-0.49%	0.40%	1.310		1.42%
18	-0.09%	-1.117		-1.58%	-0.24%	-1.394		-0.85%	-0.61%	***-2.018***	*	1.97%
	ACAR	T-Stat			ACAR	T-Stat			ACAR	T-Stat		
	(-1, -5)	***2.255***	*		(-1, -5)	0.831			(-1, -5)	1.227		
	(1, 20)	***-3.548***	**		(1, 20)	-1.147			(1, 20)	1.549		

Table 3 Ad-hoc profit announcement

	Positive Profit Announcement				Negative Profit Announcement			
Day	AAR	T-Stat		ACAR	AAR	T-Stat		ACAR
-5	0.03%	0.194		0.03%	0.05%	0.232		0.05%
-4	0.05%	0.293		0.08%	0.16%	0.697		0.22%
-3	-0.04%	-0.235		0.04%	-0.05%	-0.232		0.16%
-2	0.33%	***2.014***	*	0.38%	-0.08%	-0.339		0.08%
-1	-0.12%	-0.709		0.26%	-0.46%	***-1.972***	*	-0.38%
0	***0.87%***	***7.306***	**		***-4.78%***	***-28.329***	**	
1	-0.19%	-1.116		-0.19%	0.10%	0.445		0.10%
2	-0.10%	-0.602		-0.29%	0.11%	0.444		0.21%
3	0.17%	0.993		-0.12%	-0.02%	-0.091		0.19%
4	-0.14%	-0.853		-0.26%	0.15%	0.648		0.34%
5	-0.03%	-0.184		-0.29%	-0.02%	-0.086		0.32%
	ACAR	T-Stat			ACAR	T-Stat		
	(-1, -5)	0.672			(-1, -5)	-0.693		
	(1, 20)	***-2.383***	**		(1, 20)	0.616		

Table 4 Mergers

	With company as a bidder				With company as a target				Terminated negotiation		
Day	AAR	T-Stat		ACAR	AAR	T-Stat		ACAR	AAR	T-Stat	ACAR
-5	0.11%	1.378		0.11%	0.01%	0.019		0.01%	0.02%	0.052	0.02%
-4	0.03%	0.424		0.15%	-0.16%	-0.286		-0.15%	0.48%	1.332	0.50%
-3	0.04%	0.474		0.19%	1.65%	***2.896***	**	1.50%	-0.35%	-0.979	0.15%
-2	0.14%	***1.673***		0.32%	0.35%	0.602		1.85%	0.62%	***1.692***	0.76%
-1	0.19%	***2.266***	*	0.51%	-1.05%	***-1.852***		0.79%	-0.21%	-0.573	0.56%
0	***0.32%***	***5.378***	**		***2.91%***	***7.180***	**		***-0.12%***	***-0.470***	
1	0.05%	0.665		0.05%	0.16%	0.274		0.16%	0.08%	0.224	0.08%
2	-0.06%	-0.775		-0.01%	-0.08%	-0.132		0.08%	-0.18%	-0.510	-0.10%
3	0.02%	0.252		0.01%	-0.11%	-0.195		-0.03%	0.67%	***1.848***	0.56%
4	-0.06%	-0.791		-0.05%	-0.14%	-0.251		-0.17%	-0.06%	-0.159	0.51%
5	-0.04%	-0.492		-0.09%	-0.33%	-0.573		-0.50%	-0.05%	-0.139	0.46%
8	0.22%	***2.668***	**	0.05%	0.90%	1.586		-0.12%	0.18%	0.493	0.53%
9	0.23%	***2.775***	**	0.27%	-0.95%	***-1.654***		-1.07%	-0.37%	-1.011	0.17%
	ACAR	T-Stat			ACAR	T-Stat			ACAR	T-Stat	
	(-1, -5)	***2.679***	**		(-1, -5)	0.595			(-1, -5)	0.664	
	(1, 20)	0.506			(1, 20)	-1.089			(1, 20)	0.131	

Table 5 Restructuring

	Joint venture/Strategic alliances				Company reorganisation				Investment banker appointment			
Day	AAR	T-Stat		ACAR	AAR	T-Stat		ACAR	AAR	T-Stat		ACAR
-5	0.05%	0.271		0.05%	0.05%	0.203		0.05%	-0.08%	-0.217		-0.08%
-4	-0.04%	-0.219		0.01%	0.07%	0.284		0.11%	-0.07%	-0.191		-0.15%
-3	0.06%	0.338		0.07%	0.04%	0.179		0.15%	-0.57%	-1.583		-0.71%
-2	0.00%	0.008		0.07%	0.06%	0.254		0.21%	-0.38%	-1.063		-1.09%
-1	0.20%	1.089		0.27%	0.29%	1.264		0.51%	0.28%	0.786		-0.81%
0	***0.23%***	***1.760***			***0.00%***	***0.020***			***0.71%***	***2.765***	**	
1	-0.20%	-1.072		-0.20%	0.29%	1.247		0.29%	-0.66%	***-1.844***		-0.66%
2	0.17%	0.905		-0.03%	-0.10%	-0.444		0.19%	0.23%	0.648		-0.42%
3	-0.28%	-1.501		-0.31%	-0.21%	-0.925		-0.03%	-0.52%	-1.457		-0.95%
4	0.19%	1.038		-0.12%	-0.07%	-0.294		-0.09%	-0.21%	-0.599		-1.16%
5	-0.24%	-1.296		-0.36%	0.30%	1.309		0.21%	0.22%	0.628		-0.94%
10	-0.04%	-0.241		-0.64%	0.47%	***2.039***	*	0.99%	0.20%	0.565		-0.79%
11	0.42%	***2.259***	*	-0.22%	0.30%	1.305		1.29%	-0.50%	-1.399		-1.29%
20	-0.09%	-0.477		-0.08%	-0.06%	-0.272		0.69%	-1.00%	***-2.755***	**	-0.79%
	ACAR	T-Stat			ACAR	T-Stat			ACAR	T-Stat		
	(-1, -5)	0.640			(-1, -5)	0.945			(-1, -5)	-0.978		
	(1, 20)	-0.080			(1, 20)	0.564			(1, 20)	-0.425		

Table 6 Divestment

	Internal				External		
Day	AAR	T-Stat		ACAR	AAR	T-Stat	ACAR
-5	0.07%	0.531		0.07%	-0.10%	-0.426	-0.10%
-4	-0.12%	-0.887		-0.05%	-0.07%	-0.306	-0.17%
-3	0.19%	1.443		0.14%	0.15%	0.635	-0.02%
-2	-0.01%	-0.075		0.13%	0.05%	0.195	0.02%
-1	0.15%	1.123		0.28%	-0.13%	-0.562	-0.11%
0	***0.41%***	***4.429***	**		***0.21%***	***1.243***	
1	0.10%	0.774		0.10%	-0.33%	-1.384	-0.33%
2	-0.04%	-0.321		0.06%	0.27%	1.131	-0.06%
3	0.11%	0.814		0.17%	-0.31%	-1.312	-0.37%
4	0.05%	0.380		0.21%	-0.06%	-0.246	-0.43%
5	-0.02%	-0.145		0.20%	-0.34%	-1.458	-0.77%
10	0.26%	***1.985***	*	0.29%	-0.14%	-0.607	-1.74%
	ACAR	T-Stat			ACAR	T-Stat	
	(-1, -5)	0.919			(-1, -5)	-0.198	
	(1, 20)	0.065			(1, 20)	-1.181	

Table 7 Analyst recommendations

	Positive recommendation				Negative recommendation				Neutral recommendation		
Day	AAR	T-Stat		ACAR	AAR	T-Stat		ACAR	AAR	T-Stat	ACAR
-5	-0.16%	-1.439		-0.16%	-0.07%	-0.471		-0.07%	-0.67%	***-1.751***	-0.67%
-4	-0.04%	-0.366		-0.20%	-0.11%	-0.728		-0.19%	0.03%	0.070	-0.64%
-3	-0.23%	***-1.987***	*	-0.43%	-0.15%	-0.984		-0.34%	-0.01%	-0.032	-0.65%
-2	0.02%	0.168		-0.41%	-0.50%	***-3.217***	**	-0.84%	-0.08%	-0.202	-0.73%
-1	0.35%	***3.068***	**	-0.06%	-0.74%	***-4.760***	**	-1.59%	-0.03%	-0.071	-0.76%
0	***0.93%***	***11.424***	**		***-0.52%***	***-4.700***	**		***-0.28%***	***-1.028***	
1	0.10%	0.925		0.10%	-0.37%	***-2.341***	**	-0.37%	-0.43%	-1.128	-0.43%
2	-0.03%	-0.291		0.07%	-0.24%	-1.528		-0.60%	0.11%	0.294	-0.32%
3	-0.11%	-1.003		-0.04%	-0.02%	-0.116		-0.62%	-0.28%	-0.737	-0.60%
4	0.18%	1.582		0.14%	-0.13%	-0.814		-0.75%	-0.26%	-0.679	-0.86%
5	-0.01%	-0.105		0.13%	0.01%	0.054		-0.74%	0.45%	1.181	-0.41%
	ACAR	T-Stat			ACAR	T-Stat			ACAR	T-Stat	
	(-1, -5)	-0.239			(-1, -5)	***-4.377***	**		(-1, -5)	-0.856	
	(1, 20)	0.414			(1, 20)	***-1.854***			(1, 20)	1.488	

Table 8 Investment or expansion

	Internal				External			
Day	AAR	T-Stat		ACAR	AAR	T-Stat		ACAR
-5	0.10%	0.671		0.10%	0.10%	0.589		0.10%
-4	0.06%	0.403		0.16%	0.16%	0.949		0.26%
-3	0.18%	1.198		0.34%	0.03%	0.169		0.29%
-2	0.17%	1.122		0.51%	-0.07%	-0.394		0.22%
-1	0.26%	***1.756***		0.77%	0.20%	1.171		0.42%
0	***0.49%***	***4.559***	**		***0.29%***	***2.406***	**	
1	-0.10%	-0.677		-0.10%	-0.18%	-1.094		-0.18%
2	0.03%	0.177		-0.08%	-0.22%	-1.323		-0.41%
3	0.37%	***2.470***	**	0.30%	0.41%	***2.405***	**	0.00%
4	-0.16%	-1.052		0.14%	0.04%	0.258		0.04%
5	-0.01%	-0.050		0.13%	-0.17%	-1.013		-0.13%
10	0.31%	***2.030***	*	0.26%	-0.01%	-0.049		-0.44%
	ACAR	T-Stat			ACAR	T-Stat		
	(-1, -5)	***2.219***	*		(-1, -5)	1.071		
	(1, 20)	0.151			(1, 20)	-0.815		

Table 9 New product or customer

	New product (service)				New customer (contract)			
Day	AAR	T-Stat		ACAR	AAR	T-Stat		ACAR
-5	0.30%	1.353		0.30%	-0.29%	***-2.043***	*	-0.29%
-4	-0.16%	-0.700		0.15%	-0.08%	-0.598		-0.37%
-3	0.07%	0.299		0.21%	-0.36%	***-2.538***	**	-0.73%
-2	0.40%	***1.774***		0.61%	0.16%	1.132		-0.57%
-1	0.22%	0.976		0.83%	0.34%	***2.399***	**	-0.23%
0	***0.76%***	***4.747***	**		***0.86%***	***8.595***	**	
1	0.08%	0.375		0.08%	0.13%	0.930		0.13%
2	-0.10%	-0.455		-0.02%	0.07%	0.470		0.20%
3	-0.34%	-1.504		-0.35%	0.07%	0.503		0.27%
4	0.17%	0.740		-0.19%	-0.15%	-1.089		0.11%
5	-0.25%	-1.097		-0.43%	0.06%	0.419		0.17%
17	0.45%	***2.004***	*	1.28%	0.13%	0.925		-0.09%
	ACAR	T-Stat			ACAR	T-Stat		
	(-1, -5)	1.597			(-1, -5)	-0.714		
	(1, 20)	0.918			(1, 20)	-0.263		

Table 10 Dividend announcement

	Regular dividend			Special dividend		
Day	AAR	T-Stat	ACAR	AAR	T-Stat	ACAR
-5	-0.40%	-1.296	-0.40%	-0.59%	-1.018	-0.59%
-4	-0.21%	-0.661	-0.60%	0.33%	0.576	-0.25%
-3	0.17%	0.549	-0.43%	0.39%	0.677	0.14%
-2	-0.18%	-0.592	-0.61%	0.18%	0.311	0.32%
-1	0.31%	1.016	-0.30%	0.59%	1.015	0.90%
0	***0.02%***	***0.112***		***0.12%***	***0.289***	
1	0.32%	1.032	0.32%	-0.06%	-0.101	-0.06%
2	0.07%	0.247	0.39%	-0.20%	-0.352	-0.26%
3	-0.43%	-1.420	-0.04%	-0.75%	-1.310	-1.01%
4	0.59%	***1.936***	0.55%	0.16%	0.272	-0.86%
5	0.12%	0.380	0.66%	0.23%	0.407	-0.62%
	ACAR	T-Stat		ACAR	T-Stat	
	(-1, -5)	-0.426		(-1, -5)	0.674	
	(1, 20)	1.401		(1, 20)	-1.179	

Table 11 Share issues and repurchases

	Share issues				Share repurchases			
Day	AAR	T-Stat		ACAR	AAR	T-Stat		ACAR
-5	-0.01%	-0.167		-0.01%	0.12%	0.929		0.12%
-4	0.06%	0.784		0.04%	0.24%	***1.944***		0.36%
-3	-0.09%	-1.288		-0.05%	-0.11%	-0.853		0.25%
-2	0.01%	0.142		-0.04%	-0.21%	***-1.732***		0.03%
-1	-0.06%	-0.882		-0.10%	-0.26%	***-2.096***	*	-0.22%
0	***-0.02%***	***-0.436***			***0.12%***	***1.307***		
1	0.00%	-0.031		0.00%	0.17%	1.365		0.17%
2	-0.20%	***-2.850***	**	-0.20%	0.29%	***2.307***	*	0.46%
3	0.08%	1.156		-0.12%	0.18%	1.430		0.63%
4	0.01%	0.096		-0.11%	0.17%	1.398		0.81%
5	0.02%	0.231		-0.10%	0.11%	0.887		0.92%
7	-0.17%	***-2.464***	**	-0.25%	0.09%	0.738		1.05%
9	-0.15%	***-2.167***	*	-0.44%	0.14%	1.123		1.29%
16	-0.11%	-1.538		-0.67%	0.35%	***2.857***	**	1.87%
	ACAR	T-Stat			ACAR	T-Stat		
	(-1, -5)	-0.608			(-1, -5)	-0.782		
	(1, 20)	***-1.980***	*		(1, 20)	***2.455***	**	

Table 12 Miscellaneous news

	Miscellaneous good news				Miscellaneous bad news				Ambiguous news			
Day	AAR	T-Stat		ACAR	AAR	T-Stat		ACAR	AAR	T-Stat		ACAR
-5	0.17%	0.824		0.17%	0.17%	1.116		0.17%	0.04%	0.167		0.04%
-4	-0.10%	-0.488		0.07%	-0.15%	-0.967		0.02%	-0.11%	-0.506		-0.07%
-3	0.10%	0.482		0.17%	-0.02%	-0.161		0.00%	-0.07%	-0.300		-0.14%
-2	0.45%	***2.251***	*	0.62%	0.03%	0.217		0.03%	-0.19%	-0.848		-0.33%
-1	0.50%	***2.498***	**	1.12%	-0.08%	-0.510		-0.05%	0.12%	0.550		-0.21%
0	***1.41%***	***9.789***	**		***-0.57%***	***-5.199***	**		***0.26%***	***1.631***		
1	0.02%	0.112		0.02%	-0.14%	-0.893		-0.14%	-0.21%	-0.927		-0.21%
2	-0.06%	-0.282		-0.03%	0.11%	0.730		-0.02%	-0.20%	-0.911		-0.41%
3	-0.11%	-0.534		-0.14%	-0.09%	-0.569		-0.11%	-0.05%	-0.237		-0.46%
4	-0.20%	-0.978		-0.34%	0.04%	0.240		-0.08%	0.18%	0.830		-0.28%
5	-0.17%	-0.832		-0.51%	0.00%	0.024		-0.07%	-0.10%	-0.447		-0.37%
13	0.01%	0.052		-0.87%	-0.23%	-1.467		-0.69%	-0.47%	***-2.104***	*	-0.87%
	ACAR	T-Stat			ACAR	T-Stat			ACAR	T-Stat		
	(-1, -5)	***2.399***	**		(-1, -5)	-0.131			(-1, -5)	-0.404		
	(1, 20)	-0.981			(1, 20)	-0.905			(1, 20)	***-1.757***		