THE ECONOMIC VALUE OF THE

SELL-SIDE ANALYST IN UK EQUITY

MARKETS

A THESIS SUBMITTED TO THE CITY UNIVERSITY BUSINESS
SCHOOL IN THE SUBJECT OF ACCOUNTING AND FINANCE FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY

by

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DECLARATION

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ABSTRACT

This thesis is primarily concerned with the economic value of the sell-side analyst in the UK equity markets.

Fundamental to the sell-side analyst's economic value is the concept of market efficiency. If markets are fully efficient in the absence of the analyst then his/her investment recommendations and earnings forecast revisions would not generate abnormal returns as the information content of such earnings forecast revisions and recommendations would already have been absorbed by the market through other sources.

Though analysts' investment recommendations may generate abnormal returns, it does not necessarily follow that the sell- side analyst plays a major role in keeping the equity markets efficient. Analysts' earnings forecast revisions and investment recommendations may, in fact, explain such a small proportion of company prices changes and trading volume activity that their investment recommendations and earnings forecast revisions may be dominated by other forms of firm-specific news in explaining company share price changes and trading volume activity. In such circumstances the economic value of the sell-side analyst may indeed be limited.

Central to the analyst's role in keeping the markets informationally efficient is the nature of the information impounded into his/her investment recommendations. Is the analyst a superior processor of publicly available information and/ or is the analyst privy to private information not generally available to the market as a whole? In addition is the nature of some "information" such that, in the absence of the sell-side analyst, the information may otherwise go unreported in the marketplace perhaps arising from its intangibility (Roll, 1988)?

In this thesis we undertake three empirical investigations into the economic role of the sell-side analyst in the equity markets.

Firstly, we test the "absolute" value of sell-side analysts' investment recommendations by analysing the abnormal return performance associated with the new buy and new sell recommendations made by six leading UK based stockbroking houses over the 18 month period January, 1994 to June, 1995.

Secondly, we explore the "relative" value of analysts' recommendations and earnings forecast revisions by determining the size (proxying for information content) of company "large" market-adjusted price changes and trading volume movements that are triggered by analysts' recommendations and earnings forecast revisions vis-à-vis other firm specific information categories. We perform this test on 215 London Stock Exchange FTSE 100 and FTSE Mid 250 companies covering the two-year period January, 1994 to December, 1995.

Thirdly, we directly test the nature of the analyst's informational advantage, and in particular his/her ability to act as a conduit for the flow of "nonpublic" information to the market. We perform this test for a sample of 100 companies drawn predominantly from the upper regions of the FTSE Mid 250 Index. In addition, in performing this test, we examine the nature of the information not apparently in the public domain and whether it differs in nature from its "publicly -available" counterpart (Roll, 1988).

Our results show that analysts' investment recommendations have value in an "absolute" sense. We find that share prices are significantly influenced by analysts' recommendation changes, not only at the time of the recommendation change but also in subsequent months. We also find that the magnitude of the abnormal return performance generated is influenced cross-sectionally by factors associated with firms' information environments and the analysts' incentives literature.

In addition, we report that analysts' earnings forecast revisions and recommendations not taking place concurrently with other firm specific information releases account for 18 % of large "explained" price changes and 16% of large "explained" trading volume movements thus suggesting that sell-side analysts have a major role to play in keeping the equity markets efficient.

Finally, we find that the sell-side analyst is able to explain in excess of 90% of those price movements not traceable to "publicly-available" information which is consistent with a high degree of market knowledge. We find that a significant proportion of these price changes (17%) are attributable to factors unrelated to information per se thus providing support for Roll's (1988) hypothesis that a significant proportion of company price changes are triggered by "soft" events relating to fads, fashions, sentiment etc.

In summary, therefore, the sell- side analyst plays a major role in the UK equity markets. His/her investment recommendations and earnings forecast revisions communicate valuable information to the market. In addition, an important aspect of the analyst's role in the market is to communicate information to the market that may not be available from other more conventional sources, thus suggesting that tests of the investment value of analysts' company recommendations and earnings forecast revisions may, at least in part, be tests of strong-form efficiency. A substantial proportion of this information may be classified as "soft" information which in the absence of the sell-side analyst may otherwise go unreported.

CHAPTER 1

INTRODUCTION

1.1 Overview

Sell- side analysts occupy a privileged position in the equity markets. They process information from a variety of sources (Arnold and Moizer, 1984; Bauman and Johnson, 1996) and communicate their views to the financial marketplace through their investment recommendations and earnings forecast revisions (Shipper, 1991).

Stockbroking houses spend millions of pounds each year gathering, processing and disseminating information to the investment community through their investment recommendations and earnings forecast revisions. Such information gathering, processing and dissemination activity is costly and is only worthwhile to the extent that the expected profits exceed the costs involved. In the same way investors are only willing to pay for analyst services to the extent that the benefits exceed the costs incurred.

In this thesis we are concerned with the economic value of the sell-side analyst in the equity markets and, in particular, whether his/her company recommendations and earnings forecast revisions have investment value. Fundamental to the economic value of the sell-side analyst is the concept of market efficiency. If the markets are fully efficient in the absence of the analyst, he/she performs no economic role, as the information content of his/her investment recommendations and earnings forecast revisions, would already be absorbed by the market, and, therefore, would trigger no abnormal returns on their dissemination.

In recent years the analyst community has witnessed considerable changes. A process of consolidation has taken place in the funds management industry increasing its economic power. In parallel with this consolidation these enlarged institutions have been developing their own internal financial expertise through improved training and a policy of hiring professional accountants thereby obviating the need to obtain such expertise indirectly from the sell-side analyst. In addition, Gaved (1997) points out that due to the conflicting incentives facing analysts their role as impartial

intermediaries has been progressively compromised, particularly amongst larger institutions (fund managers). However, smaller institutions lacking economies of scale in information gathering and financial expertise still continue to rely on the sell-side analyst.

In the context of this changing business environment and the competitive pressures facing the stockbroking industry a key research issue is whether analysts' company recommendations and earnings forecast revisions have investment value, and, if they do, from what sources do analysts' competitive advantage derive. For instance are analysts better able to interpret "publicly-available" information than the market as a whole and/or do they have privileged access to "private" information not generally available to other stock market participants? In the former case, any potential advantage that the analyst possesses derives from their superior information processing skills, particularly in relation to their interpretation of complex information (Merton, 1987). In the later case, the analyst may act as an important conduit for the flow of information to the marketplace (Fama, 1970; Holland, 1998).

The weight of the evidence (predominantly US) suggests that analysts' recommendations have investment value (e.g. Womack, 1996). However, the number of recent studies examining the investment potential of brokers' recommendations in a UK context is limited. The notable exception is Dimson and Fraletti (1986).

No existing research addresses the "relative" value of analysts' recommendations vis-à-vis other firm specific information sources in explaining company market-adjusted price changes and trading

volume movements during the course of a financial year.

In other words, analysts' recommendations may indeed be valuable in an "absolute" sense but they may rank secondary to other more valuable information releases. In these circumstances then the economic value of the analyst in the equity market may be limited.

1.2 The "Absolute" Value of Analysts' Recommendations

We examine the share price reaction to the new buy and sell recommendations of six leading London based stockbroking houses over the 18 month period January, 1994 to June, 1995.

If analysts' recommendations have investment value they will trigger an abnormal price movement at the time of the recommendation change. This may arise either from their superior processing of existing publicly- available information or the dissemination of previously non-public (private) information to the market.

The weight of the recent international evidence (predominantly US) tends to suggest that analysts' recommendations have investment value (e.g. Bjerring, Lakonishok, and Vermaelen, 1983; Elton, Gruber, and Grossman, 1986; Stickel, 1995; Womack, 1996).

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Very little evidence exists in the UK on the price impact of stockbrokers' recommendations. The most recent study published was in 1986 by Dimson and Fraletti. Their results suggest that the associated abnormal returns are marginal at best and would in any case be zero if transaction costs are taken into account.

Our results, in Chapter 3, suggest that analysts' recommendations have investment value in an "absolute" sense. Share prices are significantly influenced by analysts' recommendations both in the month of the recommendation and in subsequent months. In addition, we show that the magnitude of the price response generated is influenced by factors associated with firms' information environments and the economic incentives facing analysts.

1.3 The "Relative" Value of Analysts' Recommendations

Examining the price impact of analysts' earnings forecast revisions and investment recommendations may be regarded as assessing the economic value of the analyst in "absolute" terms. The typical procedure is to apply an event study methodology to a population of analysts' recommendations and/ or earnings forecast revisions to establish whether in aggregate they generate an "abnormal" price and/ or trading volume impact. Abnormal returns are classified as abnormal by reference to some pre-specified return- generating model. If abnormal returns are generated then analysts'

recommendations and earnings forecasts have value relevance to the market.

However, analysts' recommendations and earnings forecast revisions represent only one possible source of information release that may affect company specific price changes or trading volume movements during the course of a financial year. Others could include preliminary earnings announcements, interim earnings announcements, AGM, dividend changes, takeover bids, capital structure changes, trading in large blocks of shares, notifications of insider dealings, management changes, new product announcements etc. All these categories of events, and others, have been shown to influence share price movements and trading volume activity (e.g. Brookfield and Morris, 1992; Thompson, Olsen and Dietrich, 1987; Morse, 1982a).

No extant study, however, has examined the "relative" impact of analysts' earnings forecast revisions and recommendations vis-à-vis other categories of company specific information. In other words, how do analyst investment recommendations and earnings forecast revisions rank relative to other categories of news in explaining abnormal returns and trading volume movements?

The "relative" impact or economic significance of the analyst can be assessed for each company by comparing the magnitude of the price and trading volume impact of recommendations and earnings forecast revisions relative to other news categories. This provides insight into the marginal information content of a recommendation

or earnings forecast revision relative to other information releases. The larger the price and/ or trading volume impact, the greater the information content of the associated event.

In Chapter 4 we show for a sample of 215 FTSE 100 and FTSE Mid 250 companies that analysts' earnings forecast revisions and investment recommendations account for a significant proportion of "large" market- adjusted price changes and trading volume activity. On this basis we confirm that the analyst plays a significant role in keeping the market informationally efficient.

1.4 Analysts' Degree of Market Knowledge and the Nature of the Information Driving Company Price Changes and Trading Volume Movements

In theory, sell-side analysts play a pivotal role in keeping the market informationally efficient. They assimilate and interpret capital market information flows that occur on a continuous basis throughout the financial year and communicate their views to the equity markets through their earnings forecast revisions and company recommendations (Brookfield and Morris, 1992).

In addition to their role of assimilating and interpreting publicly available information, the analyst may, in fact, also act as a conduit for the dissemination of previously non- public information to the

market, though this issue has received little attention in the academic literature. Notable exceptions include Holland (1998) and Walmsley, Yadav and Rees (1992).

Is the analyst a superior processor of existing public information or do they incorporate private (non-public) information into their investment recommendations and earnings forecast revisions. The analyst's role as a superior information processor is consistent with Merton's (1987) view of market efficiency. The view that their recommendations may be driven by non- public information is in keeping with Fama's (1970) definition of strong form efficiency.

To establish whether the analyst, in fact, is using non- public information in arriving at his/ her recommendation changes and earnings forecast revisions it is a necessary precondition that the analyst does indeed have access to non- public information.

No existing study on the economic role of the equity analyst addresses the analyst's degree of superior market knowledge directly in this manner.

We use the services of equity analysts from three leading City of London- based stockbroking houses to determine if they can explain company specific price movements that are apparently not explicable by reference to "publicly available" information. Presumably, if analysts have access to superior information than the market as a whole, they will use this information and communicate it to the market via investment recommendation

changes and earnings forecast revisions.

If they do not have such superior "insider" information then the source of any superior returns generated by their recommendations and earnings forecast revisions will be due to superior processing and interpretation of existing information in the public domain.

In addition, we address an unresolved issue in the literature which is the nature of any such information not in the public domain. Roll (1988) speculates that a significant proportion of firm specific price movements is not attributable to public information per se but may in fact be driven by either non- public information or by factors unrelated to information flows such as fads, fashions, industry sentiment etc. We treat the equity analyst as a knowledgeable source of non- public information and its nature to explore such issues.

Our results suggest that analysts are able to explain in excess of 90% of "unexplained" price movements. This is consistent with the analyst possessing a high degree of market knowledge i.e. what drives company price activity. In addition, we find that a not insignificant proportion (17%) of these unexplained movements are driven by soft factors unrelated to the flow of information per se as hypothesised by Roll.

1.5 Organisation of the Remainder of the Thesis

In chapter 2 we place our three empirical studies in the context of the extant literature on the role of the sell-side analyst in equity markets. In particular, we address the analyst's role in keeping the equity markets informationally efficient. We argue that the analyst's role in this context is dependent on both the incentives for information acquisition and its dissemination.

In chapter 3 we assess the abnormal return performance associated with new buy and new sell recommendations made by six leading London based stockbroking houses over the 18 month period January 1994 to June 1995. In addition, we control for factors which may cross-sectionally be expected to affect the performance of these recommendation changes.

Chapter 4 addresses the relative value of the sell-side analyst's investment recommendations and earnings forecast revisions vis-à-vis other sources of firm specific news in explaining company "large" market-adjusted price changes and trading volume movements during the course of a firm's financial year.

Chapter 5 assesses the economic role of the analyst in explaining those price movements that are not apparently attributable to "publicly-available" information. In this context we gain insight into the analyst's degree of market knowledge. We also gain insight into the nature of the information that is not in the "public domain" and whether it differs in content to information releases coming

from "publicly- available" sources.

In chapter 6 we summarise the three components of the thesis and discuss the implications our results may have for the economic value of the sell-side analyst in the equity markets and suggest potential areas for future research.

CHAPTER 2

THE SELL-SIDE ANALYST AND EQUITY MARKET INFORMATION FLOWS

Sell- side equity analysts occupy an important position in the capital markets literature. They process information from a variety of sources and communicate their views to the investment community through their investment recommendations and earnings forecast revisions.

The literature suggests that sell- side analysts' recommendations have investment value (Womack, 1996; Stickel, 1995). Similar evidence exists

for analysts' earnings forecast revisions (e.g. Abdel- Khalik and Ajinkya, 1982; Stickel, 1990,1991; Forbes and Skerratt, 1992).

This thesis analyses the economic role of the sell- side analyst in the UK equity markets in three key aspects. In this chapter we review the extant literature on the analyst to place our empirical research outlined in the previous chapter in context.

The key issue we address is the role of the analyst in keeping the equity markets efficient. If analysts' recommendations and earnings forecast revisions have economic value then that implies that analysts play a key role in keeping the market informationally efficient.

Section 2.1 discusses the extant literature on market efficiency that motivates our research. Sections 2.2 - 2.5 explore whether any price response to sell-side analysts' recommendations and earnings forecast revisions is due to superior processing of existing publicly available information or whether they also act as a conduit for the dissemination of previously non-public information to the market. The existing literature suggests, that in all probability, the analyst's role is a combination of both of these.

In addition, we argue in sections 2.6 and 2.7 that the nature of the analyst's role is dependent on both the incentives for information acquisition and its dissemination. The incentives for information acquisition are a function of several factors. These factors are addressed in the information environment literature. Independent of information acquisition, there are also differential incentives for analysts to

disseminate positive and negative information to the market through their investment recommendations and earnings forecast revisions.

Fundamental to our research is the concept of market efficiency. If markets are fully efficient in the absence of the investment analyst then the analyst plays no economic role in the equity markets. Their investment recommendations and earnings forecast revisions would generate no price or trading volume response as the information content of their recommendations and earnings forecast revisions would have already have been absorbed by the market.

The information environment literature suggests that less information is available about smaller firms due to the lack of incentives for information gathering by investors, analysts and the financial press.

In chapter 3 we argue that as information about smaller firms is gathered less frequently analysts' recommendation changes in respect of these firms will have more information content for the market and hence generate a higher price response than otherwise similar recommendations in respect of larger firms.

In addition, we expressly take into account the differential incentives for disseminating positive and negative information to the market when we examine the cross- sectional determinants of recommendation performance.

In chapter 4 we hypothesise that sell-side analyst activity will explain a significant proportion of companies major market-adjusted price changes and trading volume movements and, therefore, will constitute a key

component of a firm's information environment. In addition, we expect that the relative percentage of price changes and the level of trading volume explained by analysts' recommendations and earnings forecast revisions will be inversely related to firm size.

In chapter 5 we employ the services of the sell-side analyst to explain those company market- adjusted price changes not apparently being driven by publicly available information. This test directly assesses the role of the analyst, particularly for those companies that are not closely monitored by the financial press and company news services.

2.1 Sell-Side Analyst and Market Efficiency

Central to the equity analyst's position in the market is his/ her role in keeping the markets informationally efficient.

For Cohen, Zinbarg, and Zeikel (1987) the analyst constitutes the means whereby the market can be said to be efficient.

" It is the thousands of trained security analysts who are the eyes and ears of the efficient market. It is the industrious probing investment analyst who ensures that relevant information and even rumour and hypotheses are quickly reflected in the current price, and who by their collective weight and chain reaction to prospective trends helps to determine the future price. "(p. 135)

Similarly Brookfield and Morris (1992) argue:

"In terms of the British securities market, where over 70% of listed equities in terms of capitalised value are controlled by financial intermediaries, fund managers rely on the skills of a relatively small number of financial analysts. They in turn collect, sift and synthesise information from a variety of sources and continuously revise their profit forecasts". (p. 585)

2.1.1. Nature of Market Efficiency

Fama (1970) introduced the familiar three- part taxonomy of market efficiency with each representing a form of the following statement: The market is efficient with respect to an information set if security prices reflect that information set.

The market is weak form efficient if the information set is historical prices, semi-strong if the information set is information that is obviously publicly available and strong form if some investors have monopolistic access to information relevant to price formation.

Market efficiency tests require (1) a theory of the type of information (e.g. earnings increases) that affects share prices and (2) a test of whether in fact it does.

Importantly, Ball (1992) points out that a fundamental limitation of market efficiency theory is that it is a pure exchange theory and hence totally silent on how information is produced, acquired and processed by

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analysts and investors. It assumes that given the supply of public domain information, rational investors' actions will lead to market efficiency.

2.1.2 Strong vs. Semi-Strong Form Efficiency

McGoun (1990) points out that the distinction between information that is publicly available and information to which certain investors or groups of investors have monopolistic access is only clear in the extremes.

Crossland and Moizer (1995a) argue:

"At one end of the continuum is information that is announced very publicly such as annual earnings and bonus issues of shares. At the other is all information relevant to the valuation of a share that is 'knowable', including non-public information. At this extreme some purists would argue that strong form efficiency implies that prices reflect what no- one knows or what no- one has taken into account." (p. 2)

Strong form tests are concerned with whether investors have preferential access to information that is relevant to price formation. But such tests are fraught with danger.

There needs to be a clear definition of what is private and what is publicly available information: when does information become public; and which investors are the public.

Tests of the valuation impact of stockbrokers' recommendations and earnings forecast revisions are therefore either tests of strong form efficiency or semi-strong form efficiency depending on whether the information impounded into the analysts' information set is publicly available or derives from private sources.

2.2 Nature of the Analyst's Informational Advantage

The nature of the analyst's informational advantage is an unresolved issue. The literature suggests that the analyst is a superior information processor but also that he/ she may possess "insider" information (Holland, 1998; Womack, 1996; Stickel, 1995).

Womack and Stickel both report that the release of analysts' recommendations do not appear to be related to the release of firm-specific news. However, they do not explicitly test this. Holland reports that there are incentives for company management to disclose certain types of information privately to analysts rather than publicly to the market as a whole.

If analysts' recommendations and earnings forecast revisions have investment value they arise either from the analysts' superior processing of publicly available information or alternatively that the analyst is acting as a conduit for the dissemination of previously private (non- public) information to the market.

Merton (1987) and Grossman and Stiglitz (1980) argue that it is possible to generate superior returns from trading on the basis of publicly available information.

Merton argues that the standard assumption that the diffusion of every type of public information takes place instantaneously among investors and investors act on it as soon as it arrives may be suspect. This argument is made in the context of a possible explanation for the existence of empirical anomalies in the market.

" The acquisition of information and its dissemination to other economic units are, as we all know, central in all areas of finance, and especially so in capital markets. As we also know, asset- pricing models typically assume both that the diffusion of every type of publicly available information takes place instantaneously among all investors and that investors act on the information as soon as it arrives. Whether so simple an information structure is adequate to describe empirical asset pricing behaviour depends on both the nature of the information and the time scale of analysis. It may, for example be reasonable to expect rapid reactions in prices to the announcement through channels of new data (e.g. earnings or dividend announcements) that can be readily evaluated by investors using generally acceptable structural models. Consider, however, the informational event of publication in a scientific journal of the empirical discovery of an anomalous profit opportunity (e.g. smaller capitalised firm earns excessive risk- adjusted returns). The expected duration between the creation of this investment opportunity and its elimination in the market place can be considerable. " (p. 489)

Merton argues that the equity analyst can play a major role in the analysis and interpretation of this information to the marketplace particularly for smaller firms where the information environment is substantially less rich.

This view is consistent with the neglected firms' literature which suggests that analysts are a major source of information to the market (Carvell and Strebel, 1984; Arbel, 1985).

In Merton's model of market efficiency firms have an incentive to increase analyst following as it will reduce information asymmetry between management and the community of investors which will have a favourable effect for firm value and the firm's cost of capital.

Grossman and Stiglitz (1980) argue that valuable information acquisition should earn a return. They start from the premise that if information is free, market efficiency implies that security prices reflect all available information. But if information is costly to collect it is efficient for the arbitrage function to be incomplete; trades by informed traders take place at prices sufficiently different from full equilibrium prices to compensate them for the cost of becoming informed.

" If trades are made at prices that reflect full information the market is over-efficient. It is so well informed that that it cannot compensate the information gathering function, a clearly unstable position. " (p 404)

In other words they argue that if there are no incentives for information gathering no information gathering would take place. If no information gathering takes place the markets cannot possibly be efficient. This creates a logical paradox. Therefore markets cannot be informationally efficient as otherwise no incentives exist for information gathering. It can be argued in this context that the analyst is a low cost provider of information to the market and therefore plays a pivotal role in keeping the markets informationally efficient. As such he/she needs to be appropriately remunerated.

2.3 Nature of the Information Impounded into Analysts' Recommendations and Earnings Forecast Revisions

Central to the analyst's role in keeping the markets informationally efficient is the nature of the information they process. Do analysts rely on accounting information or are their investment recommendations and earnings forecast revisions driven by access to other information that investors may not be privy to?

The existing literature suggests that analysts process information from a variety of sources. Its primary focus tends to be on the role of accounting versus other information in driving earnings forecast revisions and stock recommendations.

Methodologies employed vary across studies. Arnold and Moizer (1984) adopt a questionnaire based approach and ask analysts to rank, in order of importance, the types of information that are important to them in arriving at their recommendations. They find that the most influential sources on share valuation are deemed in order of importance to be the income statement, balance sheet and interim results. The next important source is discussion with company management.

Pike, Meerjanssen, and Chadwick (1993), covering a later period, find, in contrast to Arnold and Moizer (1984) and also Lee and Tweedie (1981), that discussion with company personnel and analysts' meetings dominate the annual and interim report. No direct comparison of the importance of the analysts meeting can be made directly with Arnold and Moizer or Lee and Tweedie as the analysts were not asked to evaluate that source.

However, we can justifiably infer that that source would have ranked lower than the annual and interim reports as that category may be considered to be somewhat analogous to discussions with company personnel.

The importance of the analyst meeting is confirmed by Walmsley, Yadav, and Rees (1992) whose results show that there is a significant increase in company price volatility in the aftermath of the various company meeting programmes of the Society of Investment Analysts (SIA).

Their results are consistent with the view that price sensitive information is imparted through corporate communications to the market via the equity analyst and would be consistent with the analyst being privy to "private" information. This would imply that a key component of the analyst's information set is non-public information which in turn implies that tests of the economic value of analysts' recommendations and earnings forecast revisions are, at least in part, tests of strong form efficiency.

This would, at the time of their study, have been contrary to Stock Exchange guidance given in the Stock Exchange's *Yellow Book* which requires that any information necessary to enable holders of the company's listed securities and the public to appraise the position of the company and to avoid the establishment of a false market must be notified.

The *Yellow Book* requires that information should not be divulged outside the company and its advisors in such a way as to place in a privileged dealing position any person or class or category of persons.

However, Walmsley, Yadav, and Rees (1992) suggest that there are other possible interpretations for the increase in price volatility around the time of the analysts meetings that are unrelated to the flow of price sensitive information (PSI) to the market.

Firstly, the analysts' meeting may simply serve to focus investor attention on the company. Secondly, the information disclosed may fall short of regulatory breach, and assumes significance only in the context of other information known to analysts. Thirdly, the analysts' meeting may enable the analysts to form an opinion as to the quality of management. Fourthly, some technical factor in the markets operation may give rise to noise trading.

In this context it is an interesting speculation that information on such important issues as future earnings expectations etc. may, in fact, be communicated unconsciously in a non- verbal body language manner.

2.3.1 Role of Accounting Information

The results of Day (1986) show that accounting information is important to the analyst but that typically it does not contain any price sensitive information. Its primary function is as a reference document and as a base from which to work. Her respondents did not consider it a timely source of information. In addition, her analysts note that accounting information is deficient in terms of content for share valuation purposes.

Crossland and Moizer (1995b) confirm this view of the role of accounting information in a survey of company directors, fund managers and analysts.

This analysis of the role of accounting information, in particular its lack of timeliness, is consistent with Brookfield and Morris (1992) where they argue that the equity analyst plays a major role in analysing and disseminating information on a timely basis to the markets:

" In what is a highly competitive market setting, the role of financial statements is largely to confirm or deny such earnings predictions, although the accounts themselves provide a valuable forecasting framework, and the company annual reports also contain important information disclosed on a discretionary basis. Only at the end of a financial reporting period is it possible for analysts to check out whether their quantified estimates of the effects of the particular events have been correct. In such circumstances, one would a priori expect the market to anticipate on a gradual basis the period on period earnings changes." (p. 584)

This does not mean that accounting releases are not important to sell-side analysts. Brown and Han (1992) show that analysts' long range earnings forecasts improve after earnings announcements and Brown and Rozeff (1979) find that analysts' forecasts of future quarterly earnings become more accurate following the release of interim financial reports.

In addition, the quality of accounting disclosures influences analysts' decisions to follow firms. Lang and Lundholm (1996) examine the link between firm disclosure policy and analyst behaviour.

Their results suggest that firms with more informative disclosure policies have a larger analyst following, more accurate earnings forecast revisions, and less dispersion among individual analyst's earnings forecasts.

The argument is that increased disclosure increases investor following, reduces estimation risk and information asymmetry, each of which will reduce the cost of capital.

2.3.2 Role of Private Information

Interestingly, Bauman and Johnson (1996) is the only study that asks analysts to assess the importance of private information in arriving at their investment recommendations.

The authors evaluate the importance of different information sources to analysts across eleven countries. They find that the source of information that analysts consider as being the most important is the company's financial statements. The second most important source is contacts made with company management.

Their categories "Rumours, leaks, tips, or gossip from friends and business acquaintances" and "Non-public information" rank 13th and 15th respectively out of a total of 16 categories. The ranking for the UK is 13th and 14th respectively.

Their results seem to suggest that non- public (private) information is not important to analysts in arriving at their recommendation. But there are important caveats.

Firstly, as already discussed, the distinction between private and public information is blurred. For example, analysts' discussions with corporate management are privy to the analysts and management only and may therefore be properly classified as " private" information. This is treated as a separate category to private information in Bauman and Johnson's study.

Secondly, analysts are likely to under-report the amount of private information they may have access to in case they run foul of insider trading rules, or are in breach of stock exchange guidance rules on the dissemination of price sensitive information.

The results of these studies must be cognisant of the possible limitations associated with questionnaire based methodologies (e.g. Breton and Taffler, 1999).

Other studies adopt experimental methodologies and examine aspects of the analyst's information processing activity, principally their use of accounting information in arriving at their investment decisions (e.g. Day, 1986; Biggs, 1984; Bouwman, Frishkopff and Frishkopff, 1987). Again such studies have potential methodological problems (Breton and Taffler, 1999) as they tend to give analysts an information set and ask them to form a view on potential investment candidates or to value a company using this alone. A major component of the material distributed to the

analysts is accounting information. Therefore the subjects are not free to select the information they would actually use in making their investment decisions but rather information that the researchers think they probably use.

Other studies adopt a content analysis methodology of stockbroker circulars such as Rogers and Grant, 1997; Previts et al, 1994; and Breton and Taffler, 1999.

The first two studies focus on the role of accounting information and suffer from a potential bias as only accounting information is considered.

Breton and Taffler, in contrast, evaluate the full text of broker reports in explaining the differential importance of accounting versus non-accounting information. They find that analysts are more concerned with a firm's management and strategy and its trading environment than with accounting based measures in arriving at their recommendations.

Given that accounting information ranks secondary to other more timely information releases, particularly contacts with company management, the question is what types of information do analysts obtain from company management and what are the incentives for management to disclose information to a subset of analysts rather than to the market as a whole.

2.4 Incentives for Companies to Disclose Non- Public Information to Analysts

We have seen that analysts regard information flows from management as critical to the share valuation process. An obvious question arising from this is what are the incentives for management to disclose information to analysts? This is important as, if this is true, it suggests that analysts may have an informational advantage over other stockmarket participants. This may possibly explain the market's response to their investment recommendations and earnings forecast revisions.

Holland (1998) addresses this issue. He conducted confidential interviews with executives in 33 UK listed companies representing 29 FT sectors. The sample consisted of 21 companies in the FTSE 100 with the remainder drawn from the FTSE Mid 250 and FTSE 250 to 550 groups.

The participants did not view public disclosure as the best option for information dissemination to the marketplace. However, public disclosure methods are adopted to satisfy legal and Stock Exchange requirements, financial reporting standards, operating and financial review (OFR) guidance and, importantly, to legitimise private voluntary disclosure around the same public information set.

Management prefer private voluntary disclosure either to key institutional shareholders and/or to financial analysts for a number of reasons.

Firstly, they seek the support of these institutions during takeover bids. The analyst is important here as a conduit to the fund managers and the media.

This is consistent with Gaved (1997):

" Brokers analysts are an important audience in the management of investor relationships because of their direct links to: market makers and institutional salesforces, when these are part of the same organisation; fund managers as institutional clients; and sometimes also the media. "
(p. 18)

Equity analysts are argued to be particularly important as a conduit of information to smaller fund managers. Gaved argues:

"However, the role of analysts as impartial intermediaries has been progressively compromised in the eyes of many institutional investors. This is one of the reasons why their influence has declined over the past few years, particularly amongst larger fund managers.

In contrast, many smaller fund managers have a greater reliance on the views of sell side analysts. Their interest may be far more on working out which are the best analysts and focusing on what they say rather than direct contact with companies and making personal assessments of management competence. " (p. 12)

Secondly, selective disclosure is seen as a technique for building up reputational capital in the market for senior executives.

Thirdly, senior company executives believe analysts and institutions adopt a long- term perspective in assessing a company as an investment.

This is consistent with Marston (1993) who surveys company management and finds:

" The vast majority of respondents believe in the value of these communication channels and they seem satisfied with the quality of research produced by analysts. Most of the companies consider the brokers' analysts and fund managers take a long term view and are not unduly interested in short term gains. "

Fourthly, senior company personnel identify certain limitations associated with financial information. This arises both from the complexity of the financial information disclosed in the annual report, requiring further elaboration, together with perceived lack of value relevant disclosure. This view of the financial statements is consistent with Gaved (1997) and Marston (1993).

Fifthly, there are transaction cost disincentives in organising bigger public information meetings between management and investors.

Sixthly, senior management have the expectation that analysts will keep the wider market informed of the value relevance of the information released at these "private" meetings. This is consistent with Merton's (1987) model of capital market equilibrium with incomplete information. He argues that the analyst plays an important role in keeping the market efficient, particularly for smaller firms where the information environment is less rich.

Seventh, a major advantage of these meetings is that they provide a two-way flow of information. One manager commented:

" They give us an opportunity to rethink strategy as they pose (the analysts and the institutions) very interesting questions. "(p. 44)

Eighth, the process of concentration in the funds management industry heightens the importance of company communication with selected institutional investors and analysts.

Gaved (1997) points out that 50% of the equity value of the London market is held by 50 institutions, with the top 20 holding one third of the market. The biggest fund manager, Mercury Asset Management (MAM), held 4% of the market. Since Gaved produced his report two years ago a continuing process of consolidation has also taken place in the stockbroking industry.

Holland (1998) indicates that the information communicated through such private channels consists primarily of strategic issues, the firm's trading conditions and soft information releases such as a company's R&D programme.

The implication for our study is that the analyst is likely to be privy to information that is not generally available to the market. Thus, a major role analysts may play is in the dissemination of important "private" information to the market, inter alia, through their investment recommendations and earnings forecast revisions.

2.5 Analysts' Information Processing Ability

In addition to the analyst's role in communicating non- public information to equity markets, the analyst may also add value in terms of his/ her superior processing of existing publicly available information. This perspective of the analyst's role plays an important role in Merton's (1987) view of capital market efficiency in the presence of incomplete information.

Empirically, such added value will manifest itself in terms of the way analysts process information.

Bouwman, Frishkopff and Frishkopff (1987) examine the decision-making processes of professional analysts. Their analysts were provided with a set of financial materials and asked to form an opinion on potential investment candidates verbalising "whatever" came to mind during the evaluation. This methodology is known as protocol analysis and studies verbalisations of decision- making behaviour. The authors argue that this technique is particularly useful in developing an understanding of how decisions are made.

The authors' results suggest that analysts follow a "directed research" strategy whereby they seek a specific piece of information and only use a "sequential research" strategy as a safeguard after the "directed" strategy is complete.

All their analysts had a high degree of task specific knowledge. In addition, the protocols confirm the existence of "financial templates"

which are memory structures accumulating a major part of an analyst's experience.

" Financial templates are complex structures that contain a variety of knowledge: industry specific standards of what is acceptable, "pictures" of typical company behaviour, typical problems for that type of company or industry, and "ready-made" evaluations of the attractiveness of an investment." (p. 26)

Anderson (1988) assesses the information search and evaluation behaviour of a group of professional and non- professional analysts (investors). The study compares the problem solving behaviour during the analysis of an IPO using protocol analysis. The results suggest that analysts use more directed search strategies than non-professional analysts. The overall strategies for the professionals are quite uniform. They appear to use a checklist. Non-professionals, on the other hand, tend to work systematically through the data i.e. they tend to pursue a sequential search strategy. Professionals tend to search for and evaluate fewer types of information in arriving at an investment decision.

Though the Anderson study suggests that analysts' information search and processing strategies are different to non-analysts, i.e. they are more efficient and selective in processing information, it is not possible to infer from their study whether the investment decisions made by analysts are superior to those of non-analysts.

In conclusion, it appears from the literature that analysts process information from a variety of sources in making their investment

recommendations and earnings forecast revisions. Accounting information ranks secondary to other more timely information releases.

The principal non- accounting source of information is access to company management. Analysts obtain softer information from management and this softer information dominates their investment reports. Preferential access to management would imply that tests of the market's response to investment reports are tests of strong form efficiency. In addition, analysts appear to process publicly available information in a much more directed way than non- professionals do.

However, even though we have argued that the sell- side analyst plays a major role in keeping the equity market informationally efficient, this does not mean that the incentives for the analyst to gather information are uniform across companies. The information environment literature argues that there are fewer incentives for gathering and processing information for smaller firms.

In addition, even though the analyst may have gathered information on companies, there may be differential incentives to disseminate positive and negative information to the market.

We address what the literature tells us on these issues in the next two sections.

2.6 Firms' Information Environments

2.6.1 Incentives for Information Acquisition

There is a theoretical literature which argues that the larger the firm the richer will be its information environment and the more the incentives there are for information acquisition by investors. This will in turn trigger information acquisition and dissemination by stockbroking analysts and greater reporting of the activities of larger companies by the financial press.

The corollary to this is that the smaller the firm the less rich will be its information environment and hence the lower will be the incentives for financial analysts and the financial press to acquire and disseminate information.

Grant (1980), Atiase (1985, 1987), and Freeman (1987) demonstrate empirically that more information is, in fact, generated for larger firms. Size is thus a proxy for information availability.

Freeman (1987) argues that if informed investors could buy all the firm's outstanding stock at a set predisclosure price and cover their positions at the anticipated post disclosure price trading profits would vary inversely proportional to firm size. E.g. knowledge that the equity of a large firm is mispriced by 1% could be used to generate a larger trading profit than if a small firm's equity were mispriced by 1% .

Such informed investors will trade on the basis of this privately developed information until it is fully reflected in the stock's price. Information production thereby increases the precision of the share price valuation. Thus in this case, precision is a decreasing function of the unknown (costless) fully revealing equilibrium price.

Atiase (1985) argues that the post- information search equilibrium prices of large firms are more precise than those of smaller firms. Being more precise means that they are less likely to diverge by say 10% from their costless full information values. That is at each level of precision, expected marginal net trading profit from private information search is an increasing function of firm size.

Net trading profit can be defined as gross trading profit less search costs. According to Atiase this condition is satisfied if marginal trading profit is proportional to firm size but search cost is independent of firm size.

Thus in reaching equilibrium, trading profits earned from private information search provide incentives for more precise valuation of large firms than small firms. Accordingly, once the private search equilibrium is reached future public disclosures (which are costless to investors) have potentially greater effects on the stock prices of smaller firms than larger firms.

Freeman (1987) argues that this will also apply if information search costs differ across firms. It can be argued that conglomerates which operate in different product and market segments will be more costly to search due to the complexities of their operating environment. Larger

firms are argued to be more likely to be diversified and hence operate in more complex environments (Brookfield and Morris, 1992).

However, if marginal search costs increase with firm size but at a lower rate than marginal trading profits a large firm's securities are still less likely to be mispriced than those of a smaller firm.

The empirical literature supports the theory that the information environment of larger firms is richer than that of smaller firms.

Grant (1980) investigates the difference in the information content of the annual earnings announcement between a sample of OTC firms and a sample of larger NYSE firms. His results demonstrate that the annual earnings announcement of OTC stocks, on average, produces higher residuals than those for NYSE firms suggesting that such information releases have higher information content for OTC listed companies than those on the NYSE.

Grant attributes this difference in response to the relative information environments. In his subsequent analysis he indicates that the number of news items reported in the Wall Street Journal (WSJ) is significantly less for OTC stocks compared with NYSE firms.

Thompson, Olsen and Dietrich (1987), taking all firms listed on the NYSE and ASE between 1st January 1983 to 31st December 1983 show that larger firms receive greater coverage in the Wall Street Journal Index than smaller firms.

Atiase (1985) examines the share price impact of second quarter earnings announcements for 100 large firms and 100 small firms. He argues that the amount of private predisclosure-information production and dissemination is an increasing function of firm size. Therefore, other things being equal, the amount of unexpected information conveyed to the market should be inversely related to market capitalisation. His results are consistent with an inverse relationship between firm size and the market's response to quarterly earnings announcements.

2.6.2 Analysts and Firms' Information Environments

The literature suggests that analysts are a critical component of a firm's information environment and that analyst following is very closely but not perfectly related to firm size.

Arbel, Carvell and Strebel (1983) argue that small firms are unsuited to the investment requirements of financial institutions and hence attract minimal coverage from analysts. This is because
(1) Any sizeable investment in the firm will generate a price effect
(2) Only a small investment will be required to breach the 5% mandatory disclosure rule.
(3) The holding could quickly become large enough to necessitate managerial interest.

O'Brien and Bhushan (1990) contribute to the debate by modelling the factors determining analysts' and institutional decisions to follow stocks.

They show that size is correlated with the number of analysts following a stock and institutional ownership. Institutional decisions to hold shares are positively related to size and prior analyst following as these are factors which have been used to establish the prudence of investment in legal cases. They argue that it is not size that is important but the intervening variable of institutional ownership in ultimately determining analysts' decisions to follow stocks.

Therefore, there is a very close association between the analyst's decision to follow a stock and the degree of institutional following. In addition, size is then only important to the extent that it proxies for institutional ownership.

The literature argues that investors demand compensation in the form of a higher expected return for holding stocks not closely followed by analysts. This compensation takes the form of a higher risk premium for holding these "neglected" stocks.

Carvell and Strebel (1984) argue that for "neglected" firms the historical CAPM beta is not useful as an ex ante measure of future risk. They argue that it can be improved by incorporating the dispersion of analysts' earnings forecasts for the firm relative to the degree of dispersion of earning forecasts for all firms as a proxy for future estimation risk. The argument is that the more highly dispersed the analysts' earnings forecasts are, the less rich is the firm's information environment.

They argue that a new beta incorporating the dispersion of analysts' earnings forecasts provides a possible explanation for the neglected firm effect. As the number of analysts following a firm declines, the

informational uncertainty surrounding the security increases causing a potentially greater spread among the remaining analysts.

The greater the uncertainty, and by implication the lesser the analyst following, the greater the future risk of the firm. Investors thus demand compensation for risk. A critical component of risk is the degree of information availability. In turn, it is argued, information availability is a positive function of the number of analysts following a stock.

In order to test the proposition that their new beta compensates for the greater perceived risk effect when investing in neglected securities Carvell and Strebel form three portfolios based on different degrees of neglect. They then compare their revised beta to a conventional beta calculated for a subsequent period, and find that their revised beta is a better predictor of future beta than historical beta alone. In addition, they find that the reliability of historical beta as a predictor of future risk is inversely related to the degree of neglect. The literature also suggests that apparent stock market anomalies (e.g. P/E effect) may in part be proxies for the degree of estimation risk associated with neglected stocks in terms of less analyst coverage.

Arbel (1985) argues that the "superb" investment performance of small firms, the "outstanding" performance of neglected companies, the "better" performance of low p/e stocks and the January seasonality effect are all related to a common informational variable that affects investors' perceived risk level in terms of the richness of the firm's information environment. This, as we have argued above, is directly related to degree of analyst following.

In this context Arbel distinguishes between "generic stocks" and "brand name stocks". Brand name stocks are widely held by institutions and closely followed by analysts. Part of the price of these stocks is a hidden fee for the monitoring cost. Generic stocks are stocks analysts do not follow on a regular basis. He argues that this informational deficiency implies increased estimation risk for which investors seek compensation.

Arbel also investigates whether it is the degree of neglect rather than company size or the magnitude of the P/E that is the underlying factor in generating returns, and whether informational deficiency and resulting estimation risk are directly associated with neglect. He argues that (1) higher returns will be associated with informational deficiency, proxied by number of analysts following the stock, (2) other things being equal, the higher the estimation risk the higher the return, and (3) that information deficiency and estimation risk exhibit seasonal patterns that can explain the January effect.

Arbel's empirical results are consistent with the degree of neglect and not P/E or size generating higher returns. There is, however, a high correlation between size and neglect with neglected stocks tending to have lower P/Es. In addition, there is a positive relationship between estimation risk (as measured by the dispersion of analysts forecasts) and degree of neglect. There is also a positive correlation between returns and estimation risk and such a relationship is stronger in January.

Overall, Arbel's results suggest that the degree of neglect subsumes size and that the P/E effect and the January seasonal are all related to the neglect factor. In other words the degree of analyst following is a critical component of the firm's information environment.

Merton (1987), in his model of capital market equilibrium with incomplete information, also argues that the existence of stock market anomalies (e.g. size effect, P/E etc.) may be proxies for informational deficiencies associated with degree of neglect.

The literature frequently uses the dispersion of analysts' earnings forecasts as a proxy for analyst following, and by implication, for predisclosure information availability. Ajinkya, Atiase, and Gift (1991) indicate that dispersion of such earnings forecasts is an important determinant of the trading volume and test Karpoff's (1986) theory that heterogeneity of beliefs determines the intensity of trading activity. Heterogeneity of beliefs, in this context, is indicative of firms that are not closely followed by analysts.

In summary, the literature discussed in this section suggests that the degree of analyst neglect dominates other empirical anomalies including size and low P/E in explaining stock returns, and that the degree of analyst following is a critical component of a firm's information environment. Investors holding shares in firms not closely followed by the community of stockbroking analysts demand higher returns to compensate for the perceived risks involved in such companies.

The arguments we have made so far relate to incentives for information acquisition by analysts. We now focus on arguments made regarding analysts' differential incentives to disseminate positive and negative information to the market through their investment recommendations and earnings forecast revisions.

2.7 Analysts' Incentives for Information Dissemination

The literature argues that there are incentives for analysts to bias optimistically their earnings forecast revisions and recommendations in order to maintain links with management (Francis and Philbrick, 1993), to preserve the investment banking relationship (Dugar and Nathan, 1995), or to maximise trading commissions (Darlin, 1983). For negative news this may even imply that sell recommendations and negative earnings forecast revisions are suppressed (McNichols and O'Brien, 1996).

2.7.1. Maintenance of Links with Company Management

Management contacts constitute a critical information source for sell-side analysts (Arnold and Moizer, 1984; Pike, Meerjanssen, and Chadwick, 1993; Holland, 1998).

Francis and Philbrick (1993) argue that an unobservable preference for cultivating management relations encourages analysts to report optimistic earnings forecasts particularly in the presence of less favourable stock recommendations. Their sample consists of Value Line Timeliness Rankings and earnings forecast revisions. They use Value Line analysts' earnings forecast data rather than that of sell-side analysts directly as Value Line, they argue, provides a clearer test of whether incentives to cultivate management relations affect analysts' earnings forecasts. This is because broker analysts are also influenced by brokerage, investment

banking and underwriting incentives while Value Line are only influenced by their wishes to maintain relations with management. Their results show that Value Line analysts do not strive to produce earnings forecasts with minimal error, their earnings forecasts are optimistic and are, on average, more optimistic for sells than buys. This is consistent with their hypothesis that analysts, generally, will bias optimistically their earnings forecasts so as not to antagonise company management.

2.7.2 Existence of Investment Banking Relationship

In the same way, it is argued, that analysts strive to avoid antagonising management by either suppressing unfavourable reports, or by issuing biased optimistic earnings forecasts accompanying unfavourable reports, similar incentives exist in relation to investment reports for corporate clients i.e. where an investment banking relationship exists (Dugar and Nathan, 1995).

The authors argue that investment- banking pressure comes from two fronts. It comes directly from the investment- banking department and is driven by an apprehension that the client company will terminate the investment banking relationship if a negative report is issued. Pressure also comes from the management of the client firm. The existence of this pressure is important as, for brokerage firms, analyst research is an overhead and the broker usually provides reports free of charge to institutional investors.

Francis and Soffer (1997) recognise the tendency for analysts to bias optimistically their recommendations and forecasts and argue that the reactions to earnings forecasts depends on contemporaneously issued stock recommendations. They argue that investors will react more to earnings forecast revisions accompanying buy recommendations because buy recommendations are less informative than sells about the analysts' beliefs about intrinsic share values as the analysts' environment encourages issuance of favourable information about firms. In the presence of such incentives it is to be expected that the analysts will expend greater care and effort before issuing an unfavourable report which would suggest that sells contain lower valuation errors than buys.

Their results show that there is a greater price response to earnings forecast revisions when a favourable report is issued which is consistent with their hypothesis that contemporaneously issued earnings forecast revisions have greater investment value in the face of analysts incentives to issue favourable investment reports.

In the presence of incentives to issue optimistic investment reports arising either from the desire to maintain links to company management or emanating from the investment banking relationship, Womack (1996) argues that:

" Issuing "sell" recommendations can be risky since they are more visible because they are less frequent. An incorrect judgement on a "sell" is likely to be more costly for an analyst's reputation than an incorrect buy recommendation made when other analysts are more likely to be making the same recommendation at the same time. That the implicit costs of disseminating unfavourable "sell" opinions are greater than offering favourable ones can explain the large magnitude of returns at and after sell recommendations. That is if the costs of issuing a "sell" are greater, the analyst's expected returns for issuing them must be greater

as well. It is notable that the greater costs associated with sell recommendations are not related to differences in information acquisition and synthesis, but rather to the costs of disseminating information." (p. 165)

2.7.3. Other Incentives that affect the Dissemination Process

Other possible reasons for the asymmetry between buy and sell recommendations are advanced by Darlin (1983), and Diefenbach (1972).

Darlin (1983) argues that there is a bias towards the generation of buy recommendations resulting from the analyst's desire to generate trading commissions. This argument presumes that buy recommendations generate greater revenues than sell recommendations. This is argued on the grounds that sell recommendations can motivate trading only by those currently holding the stock or those willing to take more costly short positions, while buys can generate transactions from a broader set of investors.

Another possible reason for this buy/ sell asymmetry as suggested by Diefenbach (1972) is capital gains tax exposure on switching, and the fact that institutions generally enjoy net cash inflows and therefore are more likely to be seeking opportunities for investing rather than divesting.

2.8 Summary

In this chapter we addressed the extant literature on the value of the sell-side analyst in the equity markets. Pivotal to the economic value of the analyst is his/her role in keeping the equity markets informationally efficient. If markets are efficient in the absence of the sell-side analyst the analyst has no economic value as the market will already reflect the information content of his/her investment recommendations and earnings forecast revisions.

The literature argues that analysts may have an informational advantage over other stock market participants arising from their potential superior information processing skills and/or their privileged access to "private" information.

Whatever the nature of the analyst's informational advantage the literature suggests that the degree of analyst following is a critical component of a firm's information environment and that investors demand compensation, in terms of increased returns, for holding shares in firms not closely followed by the analyst community.

The literature further suggests that there are differential incentives for analysts to acquire and also to disseminate company information. Such differential incentives, it is argued, will affect the magnitude of returns generated by trading on the basis of analysts' investment recommendations and earnings forecast revisions.

In the next chapter we focus on the economic value of analysts' recommendations in an "absolute" sense by analysing the abnormal return

performance associated with the new buy and sell recommendations made by six leading stockbroking houses situated in the City of London. In addition, we control for factors which, as we have discussed in this chapter, may cross-sectionally influence the magnitude of the abnormal return performance generated.

CHAPTER 3

THE "ABSOLUTE" VALUE OF SELL-SIDE ANALYSTS' RECOMMENDATION CHANGES

3.1 Introduction

In this chapter we evaluate the economic role of sell- side analysts' recommendation changes in an "absolute" sense. We apply an event study methodology to a population of UK analysts' recommendation changes to establish whether these generate abnormal returns. In addition, we examine the cross- sectional determinants of recommendation performance.

Our sample consists of all the recommendations changes made by six leading stockbroking houses situated in the City of London over the eighteen- month period January 1994 to June, 1995.

The literature is mixed on the market impact of stockbrokers' recommendations. Several studies suggest that such recommendations do have investment value (Bjerring, Lakonishok and Vermaelen, 1983; Elton, Gruber and Grossman, 1986; Stickel, 1995; Womack, 1996; and Barber,Lehavy, McNichols and Trueman 1998). However, other, generally earlier research concludes that brokerage house recommendations do not, in fact, have investment value (Diefenbach, 1972; Bidwell, 1977; Groth, Lewellen, Schlarbaum and Lease, 1979, Dimson and Fraletti, 1986).

All of these papers, with the exception of Stickel (1995) and Barber et al (1998), fail to condition on factors, which may be related to the cross-sectional determinants of recommendation performance, such as firm size (Banz, 1981; Reinganum, 1981; Carvell and Strebel, 1984; Arbel, 1985; Barry and Brown, 1984), the existence of an investment banking relationship (Dugar and Nathan, 1995), maintenance of relations with company management (Francis and Philbrick, 1993; Francis and Soffer, 1997) and, stockbroking house reputation (Stickel, 1995). Barber et al (1998) controls for size only. Stickel controls for all of the above conditioning factors except the existence of an investment banking relationship. Nonetheless, there are a number of potential problems associated with Stickel's study, discussed below in section 3.2.5.

In contrast to the US very little evidence exists on the investment value of analysts' recommendations in a UK setting. The only exceptions are Dimson and Fraletti (1986) and Dimson and Marsh (1984). However, in the former case, the authors examine buy recommendations only and for only one stockbroking house. In addition, they do not control for potential cross- sectional determinants of firm performance. They conclude stockbrokers' buy recommendations generate statistically significant returns but these are arguably too small to be economically efficient. The second study, Dimson and Marsh (1984) is, strictly speaking, not directly comparable as the authors evaluate share return forecasts made by UK stockbrokers and not the investment value of their recommendations per se.

The next two sections, 3.2 and 3.3 review earlier work and, in particular, evaluate the methodologies and approaches taken. Section 3.4 places our work within the existing corpus and highlights our original contribution. Section 3.5 describes our methodology and data and descriptive statistics are provided in the next section. Section 3.7 provides the initial empirical results and the impact of the introduction of conditioning factors is discussed in the next two sections 3.8 and 3.9. A summary and conclusion of our findings are provided in the final section of the chapter.

3.2 Potential Problems Associated with Previous Studies on the Economic Value of Analysts' Recommendations

Existing studies on the investment potential of sell-side analysts' investment recommendations have potential problems which are explored below in separate subsections.

3.2.1 Sample Size of Recommendations

Bjerring, Lakonishok and Vermaelen (1983) and Elton, Gruber and Grossman (1986) suggest recommendations do have investment value but their studies use only 221 and 727 observations respectively. These sample sizes are considerably smaller than those of Diefenbach (1972); Groth, Lewellen, Schlarbaum and Lease (1979); and Dimson and Fraletti (1986) who suggest that brokers recommendations do not have investment value. Their sample sizes are 1255, 6200 and 1649 respectively.

However, more recent research by Stickel (1995), Womack (1996) with larger sample sizes (16957 and 1573 recommendations respectively) suggest that analysts' recommendations do indeed have investment value.

3.2.2 Sample of Stockbroking Houses

Bjerring, Lakonishok and Vermaelen (1983); Groth, Lewellen, Schlarbaum and Lease (1979); and Dimson and Fraletti (1986) consider

the recommendations made by a single stockbroking house only, thus introducing the possibility of selection bias. Of these three studies only Bjerring, Lakonishok and Vermaelen (1983), documents that the recommendations made by their single stockbroking house outperform. The possibility of selection bias is compounded in this case as the majority of the stocks followed by the house come from a single industry, oil and gas.

3.2.3 Recommendations vs. Recommendation Changes

Certain of the previous studies examine recommendations without partitioning the recommendations into new recommendations or simply reiterations of existing recommendations. It seems plausible that new recommendations would be more value relevant that simply a restatement of a previously held view.

Those studies employing recommendation changes (Stickel, 1995; Womack, 1996 and Elton, Gruber and Grossman, 1986) tend, on average, to have higher event period abnormal returns than those studies that do not distinguish between recommendation changes and reiterations of existing recommendations (Diefenbach, 1972; Groth, Lewellen, Schlarbaum and Lease, 1979; Bjerring, Lakonishok and Vermaelen, 1983). The only notable exception is Barber, Lehavy, McNichols and Trueman (1998). However, their results are not strictly comparable as the authors base their findings on the performance of portfolios of stocks that

are strong buy and sell recommendations rather than analysing all buy and sell recommendations which is the norm in previous research.

Interestingly, Dimson and Fraletti (1986) directly compare the price performance of buy recommendations and additions to buy recommendations with the latter generating higher abnormal returns. However, they note that the size of the sample of new recommendations is too small to form statistically significant conclusions about long term performance. Over the short term there does not appear to be much of a difference between new buy recommendations and reiterations of existing opinions.

3.2.4 Source of Recommendation Changes

Another potential problem arises from the source of the recommendation changes. Stickel (1995) and Barber, Lehavy, McNichols and Trueman (1998) use data provided by Zacks Investment Research. Zacks uses as its source of recommendation changes published analysts' reports. The problem is that many of these reports may come days or weeks, or even not at all after the news is first disseminated orally to institutional clients. Other studies do not suffer from this potential bias as they use more timely sources of analysts' recommendation changes.

3.2.5 Womack vs. Stickel

The most recent publishes research by Womack suggests a much larger price response to new sell recommendations than new buy recommendations at the time of the recommendation change (-4.7% v

+2.9%). In addition, initial price reactions are incomplete. For buy recommendations, the drift is modest (+2.4%) and short- lived (one month), whilst for new sell recommendations, the drift is larger (-9.1%) and extends for a longer period (6 months).

These results contrast with contemporaneous research by Stickel (1995) who, in fact, documents a smaller price response to new sell recommendations at the time of the recommendation change and a drift of one month's duration for buy recommendations only. However, four potential problems exist with Stickel's study that may potentially invalidate his results:

Firstly, Stickel uses Zacks Investment Research as his source for gathering recommendation changes. We argue in section 3.5.5 that this is not a timely source.

Secondly, Stickel includes buy to hold recommendations as "quasi-sell" recommendations. As buy to hold recommendations constitute 66% of his total portfolio of new sell recommendations this may tend to lead to the rejection of the hypothesis that new sell recommendations have investment value and also potentially conceal any possible post-recommendation drift in respect of such recommendations.

Third, Stickel uses arithmetic CARs rather than geometric CARs in cumulating abnormal returns over time. Arithmetic CARs suffer from the conceptual problem that their use implicitly amounts to rebalancing the stocks every time the abnormal returns are calculated. The appropriate measure of performance should be the "buy and hold" return. This would imply using a geometric CAR (Strong, 1992; Conrad and Kaul, 1993).

Another problem with arithmetic returns is that returns tend to be upward biased. The bias is greater the more volatile the stock (Haugen, 1999).

Fourth, Stickel argues that that he is focusing on recommendation changes only in his sample. However, this is only true if all stockbroking house recommendations are accompanied by a written circular. This is not necessarily the case. Thus, for example, what Stickel records as a new buy recommendation may, in fact, be simply a reiteration of an existing buy recommendation that was previously issued without an accompanying circular.

3.2.6 Cross- Sectional Determinants of Recommendation Performance

Even though Stickel suffers from a number of potential problems it is the only study that comprehensively examines the cross-sectional determinants of recommendation performance.

The factors that may affect, cross- sectionally, the performance of new buy and new sell recommendations arise from both the company's information environment and the economic incentives facing analysts. These associated literatures are discussed in Sections 2.6 and 2.7 of Chapter 2.

3.3 UK Evidence

Very little evidence exists in the UK on the price impact of stockbrokers' recommendations.

The only study published was in 1986 by Dimson and Fraletti. Their results suggest that the abnormal returns are marginal at best and would in any case be zero if transaction costs are taken into account.

Their study requires updating for a number of reasons:

(1) Considerable changes have taken place in the UK market since the period of their study e.g. Big Bang; the promulgation of a large number of new accounting standards; the enactment of insider-trading legislation and Stock Exchange rules on the dissemination of price sensitive information (PSI). Improved accounting disclosures may either increase or reduce the role of the analyst (Lang and Lundholm, 1996). PSI and insider trading legislation may affect the way that companies communicate with the market, and the analyst's role as a conduit between management and the investment community (Holland, 1998).

(2) Their sample consists of buy recommendation changes only. Sell recommendations are ignored. However, sell recommendations have been shown in US studies to have a greater price impact than buy recommendations (Womack, 1996; Stickel, 1995).

(3) Their sample is restricted to the buy recommendations of one stockbroking house only, thus introducing possible selection bias.

(4) They admit that their sample had a bias towards large companies. The literature suggests that the information environment for small firms is less rich than for larger firms (e.g. Freeman, 1987; Grant, 1980), and, therefore, arguably, there may be a greater price response to investment recommendations for smaller firms than larger firms (Stickel, 1995).

(5) They did not take account of factors that may be associated with the magnitude of the price response to a recommendation change such as the maintenance of links with company management (Francis and Philbrick, 1993) and the preservation of the investment banking relationship (Dugar and Nathan, 1995).

3.4 Our Contribution to the Literature

Extant work, as indicated above, may have methodological concerns associated with it. We specifically address these methodological issues in our study.

We use a unique data source for obtaining our recommendation changes that does not suffer from the potential biases arising from other competing sources.

We explicitly seek the input of the stockbroking houses themselves both in setting up the study and in the interpretations of our results.

In addition, our study is the first study to specifically incorporate the incremental impact of the investment banking relationship in the context of a multivariate model assessing the factors cross-sectionally determining recommendation performance, and we also address the potential methodological problems associated with Stickel (1995) which is the only previous study that controls in a comprehensive manner for those factors that may cross-sectionally affect the market price impact of recommendation performance.

We apply our study in a UK context where very little evidence exists on the economic value of sell-side analysts' investment recommendations.

3.5 Methodology

3.5.1 Selection of Stockbroking Houses

We analyse the price performance of the recommendation changes of six leading London based stockbroking houses over the eighteen-month period January 1994 to June 1995. The six participating houses are: ABN Amro Hoare Govett, Credit Lyonnais Laing, SBC Warburg, James Capel, BZW, and UBS.

By selecting our sample recommendations from more than one stockbroking house we avoid the possible selection bias of Bjerring, Lakonishok and Vermaelen (1983) and Dimson and Fraletti (1986) who select their sample of recommendations from only one stockbroking house. In addition, we only approached those stockbroking houses that ranked in the top 10 of the annual Extel rankings as published in the *Ranking of Investment Analysts Survey, 1994 and 1995 editions*. The strategy of only collecting recommendation changes from the major stockbroking houses ensures breadth of company coverage and that the information events analysed are made available immediately to most institutional and professional investors and hence the market.

We use the Extel "Ranking of Investment Analysts Survey to identify the top stockbroking houses operating in the UK market as it is regarded as the flagship survey for the industry. Each year a questionnaire is despatched to a sample of senior fund managers. In 1995 127 fund managers responded. The respondents were collectively responsible for the investment of over £940bn and included 72% of those who control in excess of £10bn of funds. In formulating their rank of the best investment analysts contributors were asked to take into account, inter alia, the depth of analyst knowledge of his/ her sector; the quality of their fundamental research; the success of the analyst's recommendations and the accuracy of their earnings forecast revisions. The rankings are reported on overall basis and by Stock Exchange sector.

Of the nine houses originally approached eight agreed to participate in the study. One house subsequently withdrew after the director of research was transferred within the firm. Of the remaining eight houses the data

provided by two of the houses were insufficient for our purposes. This left a total of six houses.

3.5.2 Anatomy of Company Recommendations

We focus on recommendation changes rather than simply reiterations of existing recommendations as these should be more value relevant. Those studies employing recommendation changes (Stickel, 1995; Womack, 1996 and Elton, Gruber and Grossman, 1986), not surprisingly, show higher event period abnormal returns than those studies that do not distinguish between recommendation changes and reiterations of existing recommendations (Diefenbach 1972; Groth, Lewellen, Schlarbaum and Lease, 1979; Bjerring, Lakonishok and Vermaelen, 1983).

Interestingly, Dimson and Fraletti (1986) directly compare the price performance of buy recommendations and addition to buy recommendations with the later generating slightly higher abnormal returns. However, they note that the sample size of the recommendations is too small to form statistically significant conclusions.

We obtain brokerage house recommendation changes from the books summarising the stockbroking houses views on the companies they follow which are usually published monthly.

Though they come under different names such books essentially contain the same information. Inter alia, they record financial data for each company followed. This includes data on forecasted earnings, the P/E

ratio, dividend yield, P/E relative to the market as a whole or Stock Exchange sector, net asset value, current share price and the current share price relative to share price performance over the previous 12 months. In addition they record the house's current recommendation and any earnings forecast revisions. In some cases the brokerage firm provides a summary page detailing all the recommendations and earnings forecast revisions that took place since the last publication date.

These books are normally prepared on a monthly basis, and are despatched to clients (primarily institutions) as a summary record of the effect of what has happened on a company's key financials during the course of the previous month. In the case of ABN Amro Hoare Govett the books are prepared on a weekly basis.

We abstracted the recommendation changes either directly from a summary page if it existed or, if not, by comparing the recommendation in month t with month t-1.

Brokerage houses use a variety of phrases to convey recommendations. Standardising these so that they can be compared across houses involves an element of judgement. Fortunately, in most cases, it is straightforward enough to separate the recommendations into six mutually exclusive categories:

(1) Buy to hold
(2) Sell to hold
(3) Sell to buy
(4) Hold to buy
(5) Buy to sell
(6) Hold to sell

The typical designation of the recommendations is into buy, sell and hold categories. We adopt this three- point designation in our sample. Some houses had more elaborate designations. ABN Amro Hoare Govett distinguish between "overvalued" and "sell" recommendations and between "undervalued" and "buy" recommendations.

They define their taxonomy of recommendations as follows:

"Recommendation is based on expected performance relative to the market over the next 6 months, using the following parameters: Buy +10%, Undervalued +5% to +10%, Hold, -5% to +5%, Overvalued -5% to –10%, Sell –10% " (ABN Amro Hoare Govett: "Equity Market Service" 13th –17th May, 1996).

For our purposes as both overvalued (undervalued) and sell (buy) recommendations are expected to underperform (outperform) the market we do not distinguish between them and include them both in the sell (buy) category.

Houses define the expected duration of a recommendation in different ways. The majority of houses use a time horizon of six months to one year. For instance James Capel states:

"The recommendation on the shares is based on the divergence between the current share price and our assessment of the "correct" or fair price for the shares, provided that the divergence is expected to be corrected within twelve months. " (James Capel, "The Red Book", January 1996, page 126).

A notable exception, however, is BZW who do not specifically define a timescale over which a recommendation will endure. They say:

"This is driven partly by the timescale of the investor, the experience of the company and price volatility in the market. For a portfolio manager to implement an investment recommendation and see it contribute significantly to performance may well take a period of months. This is particularly true in a period of low institutional liquidity and low market volume. Our investment recommendations and changes in those recommendations take that into account." (BZW: "UK Equity Working List", February 1996, page 53).

In addition to varying in terms of the expected timescale of outperformance (underperformance) houses also differ as to the expected magnitude of the outperformance (underperformance).

For example, James Capel define buy and sell recommendations as follows:

"Buy indicates anticipated outperformance of 15% or more and sell anticipated underperformance of 15% or more." ("The Red Book", January 1996, page 126).

Contrast this with ABN Amro where, as we saw above, the upper limit on outperformance is defined as 10% and the lower limit on underperformance is defined as -10%.

All houses define their recommendations either explicitly or implicitly relative to the expected performance of the UK market as a whole over a

particular time horizon. As such, their models do not incorporate beta or other factors. This is interesting as all academic studies use either the market model or variations of the market model in assessing the performance of analysts' recommendations. One notable exception is Womack (1996) who uses three different return- generating models: size adjusted model, industry adjusted model and the Fama and French 3-factor model.

It is interesting to note that in more recent times the nature of the analysts' performance benchmark is changing. Houses are now organising themselves on a pan- European basis, and are concentrating not on outperforming the UK market index but rather are seeking to outperform European sectoral indices. This consolidation parallels a similar shift in the European fund management industry which is being driven largely by the desire to be diversified internationally, taking bets on individual sectors. All this is eased by the development of the Euro.

3.5.3 Calculation of Abnormal Returns

We use monthly returns to calculate the abnormal returns associated with the recommendation changes in the analysis that follows. There are a number of reasons for this:

(1) We are interested in whether sell-side analysts' recommendations have long- term investment potential.

(2) Our source for the recommendation changes consists of the stockbroking houses monthly books. These books do not record the date during the course of the month when the recommendation changes. The participating stockbroking houses were asked if they had their own recommendation change monitoring system. They indicated that they did not.

(3) Womack (1996) shows that using US data abnormal returns for new buy recommendations continue for up to one month after the date of the recommendation change. The corresponding number of months for new sell recommendations is six months.

We asked the directors of research of the participating houses to rationalise Womack's findings. They suggested that there may be a time lag between the time an analyst changes his recommendation and the market price changes. The analyst communicates the recommendation change to the sales team at the early morning meeting. The sales team then ring up their client portfolio. Typically the clients will wait and seek corroborating evidence before making a decision, particularly if the news is negative. This, they say, can take several days or even weeks.

3.5.4 Selection of Event Period

Our event period runs from month –6 to + 6. This is consistent with previous research studies (Groth, Lewellen, Schlarbaum and Lease, 1979;

Dimson and Fraletti, 1986; Elton, Gruber, and Grossman, 1986; Womack, 1996).

The motivation is that previous research has documented that analysts' recommendations may in fact be "price driven" rather than "information driven". Dimson and Fraletti (1986) document that their new buy recommendations rose by 2.2% in the two weeks prior to the recommendation change. Groth, Lewellen, Schlarbaum and Lease (1979) document that for buy recommendations returns are positive and significant in each of the six months prior to the recommendation. For sell recommendations no evidence of price pressure was discovered. Elton, Gruber and Grossman (1986) report evidence of price pressure for both buy and sell recommendations in the six months prior to the recommendation but these returns are not statistically significant. Similar results are documented by Womack (1996).

Parallel evidence is available from the analyst earnings forecast literature. For example, Stickel (1990, 1991) confirms that earnings forecast revisions are associated with past price movements. Interestingly, Forbes and Skerratt (1992) using UK data find no evidence of such price following behaviour.

3.5.5 Problems Associated with Alternatives to the Stockbroking House Summary Books for Sourcing Recommendation Changes

Alternative sources for identifying recommendation changes exist but they have problems associated with them.

Investext and Dialog, for instance, are databases of written stockbroker circulars. However, not all recommendation changes result in a written circular and even where they do there may be a considerable lag between the date of the recommendation change and any associated circular. This was confirmed by our discussions with the directors of research. One director of research commented on the verbal nature of the UK market compared to the US with over half of their recommendations not having associated text. Another director of research stated that in many cases there would not be a circular accompanying a recommendation change unless there was a request for one from the house's clients.

Two potential problems arise on using stockbrokers written circulars as the source of a recommendation change as in the majority of existing studies. One problem is that there is a truncation bias as only those recommendation changes that are the subject of a circular will be included.

In addition, there may be a time lag between the date of a recommendation change and its formal publication as a circular. This creates a number of problems.

Firstly, if there is a time lag then the date of the circular is not the date of the recommendation change and is therefore not the date that the information was communicated to the market via the houses institutional clients. Therefore, we would not be testing the value of the

recommendation change per se but rather its secondary dissemination through a written circular.

Secondly, using circulars alone restricts the sample to a subset of recommendations. This is particularly a potential problem if there are differences in information content between those recommendation changes that result in a circular and those that do not.

We investigate the potential magnitude of the problem by investigating via Dialog what percentage of recommendation changes resulted in a circular in the same month that the recommendation change occurred. Of the six houses in our sample four had their circulars on Dialog: Warburg (16%); BZW (44%); ABN Amro Hoare Govett (17%); and UBS (40%). The bracketed figures represent the percentage of recommendation changes that had an associated circular. Accordingly, using Dialog as a source of a house's recommendation changes would have resulted in a severely restricted sample of circulars.

In addition, we focus on recommendation changes only. If we use Dialog as the source of our recommendation changes we raise the possibility that a proportion of the "recommendation changes" may, in fact, be the reiteration of previous recommendations if those previous recommendations were not accompanied by a circular. This is a potential problem with Stickel's (1995) study.

First Call, however, used by Womack (1996) overcomes these problems. This is a real time database that collects the daily commentary of stockbrokers, fund managers, economists etc and sells it on line to professional investors via the Internet. The cost of subscribing to First

Call is substantial. The advantage of First Call from an academic point of view is that changes in recommendation made at the early morning meeting between research staff and the sales team are put up on First Call and distributed to clients instantaneously.

However, though First Call is well established in the US it is only relatively recently established in the UK (June, 1996). Only a small number of our sample of stockbroking houses were using First Call and even in cases where they were there was not a long time series of recommendation changes available for the purpose of conducting an academic study. Only one house included the contents of the early morning meeting notes on First Call.

In cases where the company is the subject of a recommendation change the analyst is supposed to tick a box to that effect. A pilot study was conducted by requesting all the recommendation changes over the last six months in respect of two houses. No entries came up, indicating that UK analysts do not bother to use this box.

Accordingly we restrict our source of recommendation changes to the summary books of the participating stockbroking houses.

3.5.6 Analysts' Recommendations and Trading Volume Activity

A second measure of the market impact of analysts' recommendations is the impact on a company's trading volume. Womack (1996) is the only

study that measured the trading volume impact of analysts' recommendation changes. He found that, contrary to the price impact, the abnormal trading volume impact of a recommendation change quickly dissipates within a few days of the recommendation change. As we are interested in the longer- term performance of new buy and new sell recommendations we do not consider trading volume.

3.5.7 Abnormal Price Movements

To test for the existence of abnormal returns surrounding recommendation changes requires a return- generating model. We apply a variation of the market model.

The abnormal return metric employed is defined as follows:

$$U_{i,t} = AR_{i,t} - ER_{i,t} \tag{1}$$

where

$U_{i,t}$ = the abnormal return associated with company i in month t

$AR_{i,t}$ = actual return for company i in month t

$ER_{i,t}$ = expected return for company i in month t

The expected return generating model is as follows:

$$ER_{i,t} = \beta_{i,t} R_{m,t} \tag{2}$$

where

$R_{m,t}$ = return on the FT All Share Index in month t

$\beta_{i,t}$ = LBS beta coefficient for company i in month t

This is the market model with no intercept term. The market model methodology is consistent with the approach used in most previous research on stockbrokers' investment recommendations (Elton, Gruber and Grossman, 1986, Groth, Bjerring, Lakonishok and Vermaelen, 1983).

Four separate variations are employed:

Model 1: assume a beta coefficient of 1
Model 2: using LBS beta from pre-event period
Model 3: using LBS beta from post-event period
Model 4: using average of pre- and post- event period betas

The period over which to calculate beta is an empirical issue. The basic principle is that the calculation of beta should not be contaminated by what occurs in the event window. Using a pre-event period beta is consistent with the majority of prior studies adopting the event study methodology. The argument for choosing a future beta is that analysts may base changes in recommendations on past price performance. In addition, we calculate the average beta for comparison purposes.

All existing studies on the investment value of stockbrokers' recommendations bar one calculate beta over a pre-event period. The only exception is Stickel (1995) who uses a beta estimate from the post-event period on the basis that analysts may base recommendations on past price performance.

No intercept term was calculated as previous research has shown that the alpha term is not statistically significant (Firth, 1975; Brown and Warner, 1980, 1985; Rippington, 1991; Brookfield and Morris, 1992)

Returns are calculated using log prices, adjusted for dividends as follows:

$$\ln(P_t + D_t) - \ln(P_{t-1}) \tag{3}$$

where:

In = natural log

P_t = share price in month t

D_t = dividend in month t

t = time on a monthly basis.

As Strong (1992) points out there are both theoretical and empirical reasons for preferring log prices to discrete arithmetic prices in calculating returns:

" *Theoretically, logarithmic returns are analytically more tractable when linking together sub-period returns to form returns over longer intervals... Empirically, logarithmic returns are more likely to be normally distributed and so conform to the assumptions of standard statistical techniques.* " *(p. 535)*

The results using the four models are presented in Table 1 below.

Table 1

Mean Abnormal Returns Around Recommendation Changes for All Four Return-Generating Models

New Sell Recommendations

Model[a]	4		3		2		1	
Month	Abnormal Return	t-Statistic	Abnormal Return	t-Statistic	Abnormal Return	t-Statistic	Abnormal Return	t-Statistic
-6	-0.18	-0.34	-0.18	-0.35	-0.17	-0.33	-0.09	-0.17
-5	-0.07	-0.21	-0.08	-0.28	-0.06	-0.18	-0.08	-0.26
-4	-0.62	-1.66*	-0.63	-1.68*	-0.63	-1.70*	-0.62	-1.69*
-3	-0.69	-2.05**	-0.69	-2.04**	-0.69	-2.03**	-0.72	-2.09**
-2	-0.27	-0.83	-0.27	-0.83	-0.26	-0.80	-0.27	-0.82
-1	-0.73	-1.88*	-0.73	-1.88*	-0.72	-1.87*	-0.65	-1.71*
0	-3.05	-7.24***	-3.04	-7.21***	-3.06	-7.22***	-3.08	-7.19***
1	-1.68	-4.51***	-1.67	-4.53***	-1.67	-4.51***	-1.69	-4.60***
2	-0.89	-3.05***	-0.83	-2.87***	-0.83	-2.85***	-0.84	-2.89***
3	-0.66	-2.27**	-0.77	-2.66**	-0.77	-2.63**	-0.71	-2.46**
4	-0.71	-2.82***	-0.79	-3.15***	-0.79	-3.17***	-0.73	-2.95***
5	-1.11	-3.25***	-1.11	-3.33***	-1.12	-3.33***	-1.17	-3.49***
6	-0.82	-2.41**	-0.80	-2.37**	-0.80	-2.35***	-0.74	-2.19***

Table 1 (cont'd)

New Buy Recommendations

Model[a]	4		3		2		1	
Month	Abnormal Return	t-Statistic	Abnormal Return	t-Statistic	Abnormal Return	t-Statistic	Abnormal Return	t-Statistic
-6	-0.34	-1.38	-0.34	-1.38	-0.34	-1.39	-0.31	-1.23
-5	-0.34	-1.60	-0.34	-1.61	-0.33	-1.58	-0.29	-1.35
-4	-0.45	-1.83*	-0.46	-1.85*	-0.44	-1.77*	-0.37	-1.48
-3	-0.61	-2.60***	-0.62	-2.62***	-0.61	-2.60***	-0.62	-2.61***
-2	-0.48	-2.00**	-0.47	-1.99**	-0.48	-2.00**	-0.38	-1.60
-1	-0.61	-2.59***	-0.61	-2.63***	-0.60	-2.55***	-0.62	-2.62***
0	2.63	9.54***	2.62	9.51***	2.63	9.54***	2.58	9.28***
1	0.38	1.85*	0.37	1.77*	0.35	1.68*	0.38	1.81*
2	0.13	0.67	0.13	0.65	0.12	0.62	0.11	0.57
3	-0.68	-3.56***	-0.64	-3.38***	-0.63	-3.33***	-0.63	-3.28***
4	-0.04	-0.20	-0.06	-0.31	-0.06	-0.29	-0.04	-0.20
5	-0.48	-2.34**	-0.40	-1.96**	-0.41	-2.00**	-0.37	-1.80**
6	0.00	0.01	-0.04	-0.25	-0.03	-0.18	-0.05	-0.30

[a] Model 4 calculates abnormal returns using the average beta of the pre- and post- event period
Model 3 calculates abnormal returns using the post-event period beta
Model 2 calculates abnormal returns using the pre-event period beta
Model 1 calculates abnormal returns assuming a beta of 1

***= statistically significant at $\alpha=0.01$
**= statistically significant at $\alpha=0.05$
*= statistically significant at $\alpha=0.10$

The results in Table 1 show that no economic or statistical significance exists between the reported results conditioning on each of the models. In all that follows we use model 4. Adoption of model 4 enables comparison with previous research and is a reasonable compromise between those studies that employ a post-event period beta (Stickel, 1995) and those that adopt a pre-event beta (Elton, Gruber and Grossman, 1986; Groth, Bjerring, Lakonishok and Vermaelen, 1983). In addition, we argue in section 3.7.2.2 that even if we control for industry (Womack, 1996) or

size (Barber, Lehavy, McNichols and Trueman, 1999) our results are unlikely to be affected.

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3.5.8 Cumulative Abnormal Returns and related t-Statistics

As described in Sections 3.2.6 we accumulate abnormal returns over time using a geometric approach following Womack (1996) and Ritter (1991). The formula is:

$$CAR = 1/n \; \Sigma_i \; \Pi_{t \in TP} \; (1 + AR_{i,t}) - 1 \qquad (4)$$

where

n = number of buy or sell recommendations, as appropriate, in month t
$AR_{i,t}$ = abnormal return associated with recommendation i in month t
TP = the event period (test period).

The t-statistic for the CAR in month t is computed as follows:

$$t_{calc} = CAR_t * \sqrt{n_t} \; / csd_t \qquad (5)$$

where

n_t = the number of recommendations outstanding in each month, and

$$csd_t = \{t*var+2(t-1)*cov\}^{1/2}$$

where

t = event month

var = average cross- sectional variance (over 13 months)

cov = the first order autocovariance of the AR_t series

See Ritter (1991, p 10) for more detail.

3.6 Characteristics of the Sample of Recommendation Changes

Table 2 presents the matrix of 2,506 recommendation changes for the six participating stockbroking houses over the 18-month period January 1994 to June, 1995.

Table 2

Matrix of Recommendation Changes

Old Recommendation	New Recommendation			
	Buy	Hold	Sell	Total
Buy	-	846 (34%)	28 (1%)	874 (35%)
Hold	873 (35%)	-	370 (15%)	1243 (50%)
Sell	28 (1%)	361 (14%)	-	389 (15%)
Total	901 (36%)	1207 (48%)	398 (16%)	2506 (100%)

There are a total of 901 new buy recommendations and 398 new sell recommendations yielding a ratio of 2.6:1.

The comparable ratio of new buys to new sells for Womack (1996) is 6.3:1. Elton, Gruber and Grossman (1986) report a ratio from their Table 2 of 2.3:1. Stickel (1995) reports a ratio of 1.1:1. However, Stickel includes recommendation changes from buy and strong buy to hold as quasi- sell recommendations. Adjusting for this yields a ratio of 4.6:1.

Comparable evidence does not exist for the UK market as Dimson and Fraletti (1986) only consider buy recommendations in their study.

Dimson and Marsh (1984) are not directly comparable as they deal with share price forecasts and not recommendation changes per se. Breton and Taffler (1999, Table 1) report a ratio of 2.6:1 for buys to sells but they

only consider broker recommendations cross-sectionally, not recommendation changes.

We have already argued that analysts are less likely to issue sell recommendations for a number of reasons. For instance sell recommendations may be harmful to a house's present and potential investment banking relationships (Dugar and Nathan, 1995).
Also top management may limit or cut off the flow of information if a house issues an unfavourable recommendation (Francis and Philbrick, 1993). In addition, issuing sell recommendations can be more risky as they are more visible and less frequent (Womack, 1996).

As is evident from Table 2 UK stockbroking houses, on average, appear slightly less reluctant to issue sell recommendations than their US counterparts.

Table 3 breaks down the sample of new buy and new sell recommendations by industry. Both the new buy and new sell recommendations are well diversified by industry with no single industry constituting more than 7% of the total. All London Stock Exchange sectors are represented in the sample.

Table 3

Sectoral Decomposition of New Buy and Sell Recommendations

Stock Exchange Sector	New Buy Recommendations	New Sell Recommendations
Building and Construction	3%	2%
Building Materials	5%	3%
Chemicals	4%	4%
Diversified Industrials	3%	3%
Electronic and Electrical	4%	1%
Engineering	7%	7%
Engineering, Vehicles	1%	2%
Printing, Paper and Packaging	4%	2%
Textiles	2%	1%
Breweries	4%	4%
Spirits, Wines and Ciders	1%	2%
Food Manufacturers	4%	7%
Household Goods	2%	1%
Healthcare	1%	2%
Pharmaceuticals	1%	1%
Tobacco	0%	1%
Distributors	1%	1%
Leisure and Hotels	3%	1%
Media	4%	1%
Retailers, Food	2%	5%
Retailers, General	7%	6%
Support Services	4%	3%
Transport	2%	3%
Electricity	4%	3%
Gas Distribution	1%	0%
Telecommunications	1%	1%
Water	3%	4%
Banks	2%	4%
Insurance	4%	5%
Life Assurance	2%	3%
Merchant Banks	2%	2%
Other Financial	4%	2%
Property	3%	7%
Investment Trusts	0%	0%
Extractive	1%	1%
Oil, Integrated	1%	1%
Oil, Exploration	2%	3%
Business Support	0%	0%
Metals	1%	1%
Total (%)	100%	100%
Total	901	398

Table 4 reports the Stock Exchange index characteristics of the new buy and sell recommendations. The sample is not overly biased towards large capitalisation stocks as in the case of Dimson and Fraletti (1986) and Womack (1996). Approximately one third of both new buy and new sell recommendations are in respect of firms that lie outside the FTSE 100 and FTSE Mid 250 indices. More importantly, the index constituents of the new buy and new sell recommendations are broadly similar.

Table 4

Index Constituent Decomposition of the New Buy and Sell Recommendations

Index	New Buy Recommendation	New Sell Recommendation
FTSE 100	26%	33%
FTSE Mid 250	40%	41%
Other	34%	26%
Total (%)	100%	100%
Total	901	398

The distribution of the time a recommendation spends on the recommended list is presented in Table 5. Once a recommendation is removed from the recommended list we no longer include it in the calculation of abnormal returns.

Table 5

Distribution of Time Spent on Recommended Lists

Length of Recommendation Period	New Buy Recommendation	New Sell Recommendation
1 month	32 (4%)	20 (5%)
2 months	67 (7%)	39 (10%)
3 months	53 (6%)	29 (7%)
4 months	41 (5%)	19 (4%)
5 months	45 (5%)	19 (4%)
6 months	52 (6%)	25 (6%)
> 6 months	611 (67%)	247 (64%)
Total	901 (100%)	398 (100%)

A comparison can be made with Dimson and Fraletti (1986). In their sample of 132 companies that were new buy recommendations only 14% remained on the recommended list for more than 6 months. This compares with 67% of buy recommendations remaining on the list for greater than 6 months in our sample. The length of time the average recommendation stays on the recommended list is broadly consistent with how our sample of stockbroking houses defines their recommendation periods.

3.7 Event Period Abnormal Return Performance

As no difference is apparent conditioning on the model employed empirically (see section 3.5.7 above) we use Model 4 (using pre- and post-event period betas) in all subsequent analysis. Adoption of this formulation enables comparison with previous research and is a reasonable compromise between those studies that employ a pre-event period beta and those that adopt a post- event period beta.

The abnormal return performances attributable to new buy and new sell recommendations are presented in Tables 6 and 7 respectively. The robustness of the return patterns and associated t-statistics are discussed below in section 3.7.2.

Figures 1 to 4 present graphs of the cumulative abnormal returns attributable to the new buy and the new sell recommendations.

For comparison purposes, alternative dates for cumulating abnormal returns are presented.

The cumulative abnormal returns with returns cumulated from six months prior to the recommendation change for new buy and sell recommendations respectively are documented in Figures 1 and 2. Figures 3 and 4 present the cumulative returns for new buy and sell recommendations respectively with returns cumulated from the month preceding the recommendation change.

Table 6

Mean Abnormal Returns Around Recommendations Changes: New Buy Recommendations

Month of listing	Abnormal return	Abnormal return t- value	Cumulative abnormal return (-6,+6)	Cumulative abnormal return t- value	Cumulative abnormal return (0,6)	Cumulative abnormal return t- value
-6	-0.34	-1.38	-0.34			
-5	-0.34	-1.60	-0.71	-2.27**		
-4	-0.45	-1.83*	-1.19	-3.09***		
-3	-0.61	-2.60***	-1.86	-4.25***		
-2	-0.48	-2.00**	-2.38	-4.93***		
-1	-0.61	-2.59***	-3.01	-5.72***		
0	2.63	9.54***	-0.53	-0.90	2.63	
1	0.38	1.85*	-0.20	-0.33	3.01	8.55***
2	0.13	0.67	-0.04	-0.06	3.15	7.71***
3	-0.68	-3.56***	-0.70	-1.02	2.49	5.38***
4	-0.04	-0.20	-0.65	-0.89	2.45	4.82***
5	-0.48	-2.34***	-1.14	-1.53	2.00	3.63***
6	0.00	0.01	-1.13	-1.47	1.91	3.45***

***= statistically significant at α=0.01
** = statistically significant at α=0.05
* = statistically significant at α=0.10.

Table 7

Mean Abnormal Returns Around Recommendation Changes: New Sell Recommendations

Month of listing	Abnormal return	Abnormal return T value	Cumulative abnormal return (-6,+6)	Cumulative abnormal return t value	Cumulative abnormal return (0,6)	Cumulative abnormal return t value
-6	-0.18	-0.34	-0.18			
-5	-0.07	-0.21	-0.32	-0.57		
-4	-0.62	-1.66*	-0.98	-1.52		
-3	-0.69	-2.05**	-1.68	-2.27**		
-2	-0.27	-0.83	-1.90	-2.36**		
-1	-0.73	-1.88*	-2.70	-3.24***		
0	-3.05	-7.24***	-5.75	-6.52***	-3.05	
1	-1.68	-4.51***	-7.40	-8.18***	-4.73	-8.70***
2	-0.89	-3.05***	-8.19	-8.76***	-5.61	-9.30***
3	-0.66	-2.27**	-8.73	-9.01***	-6.28	-9.08***
4	-0.71	-2.82***	-9.26	-9.21***	-6.99	-9.15***
5	-1.11	-3.25***	-10.25	-9.92***	-8.09	-10.03***
6	-0.82	-2.41**	-10.76	-9.65***	-8.91	-9.78***

***= statistically significant at α=0.01
** = statistically significant at α=0.05
* = statistically significant at α=0.10.

Figure 1

Mean Cumulative Abnormal Returns Surrounding New Buy Recommendations: Base Date Month - 6.
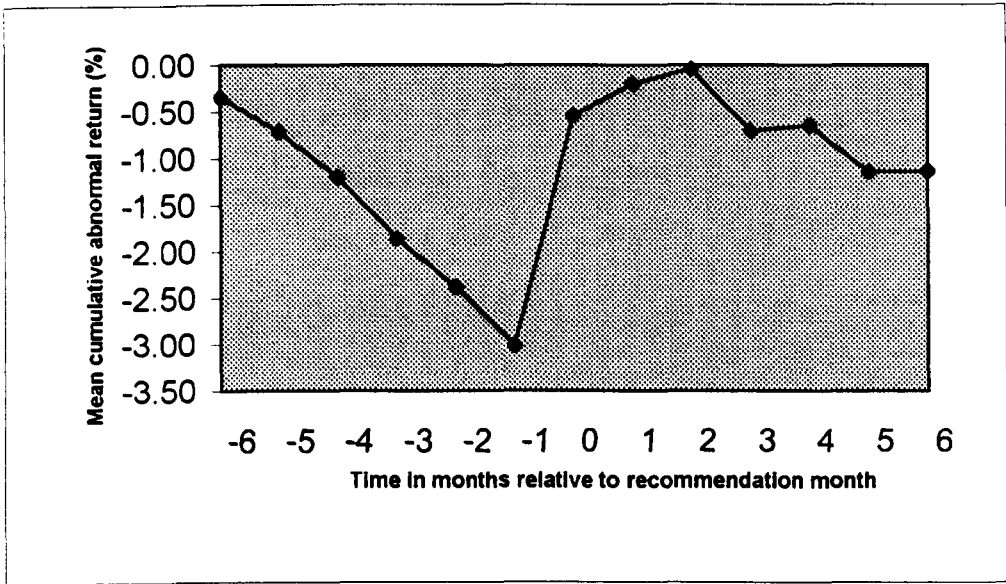
Figure 2

Mean Cumulative Abnormal Returns Surrounding New Sell Recommendations: Base Date Month - 6.
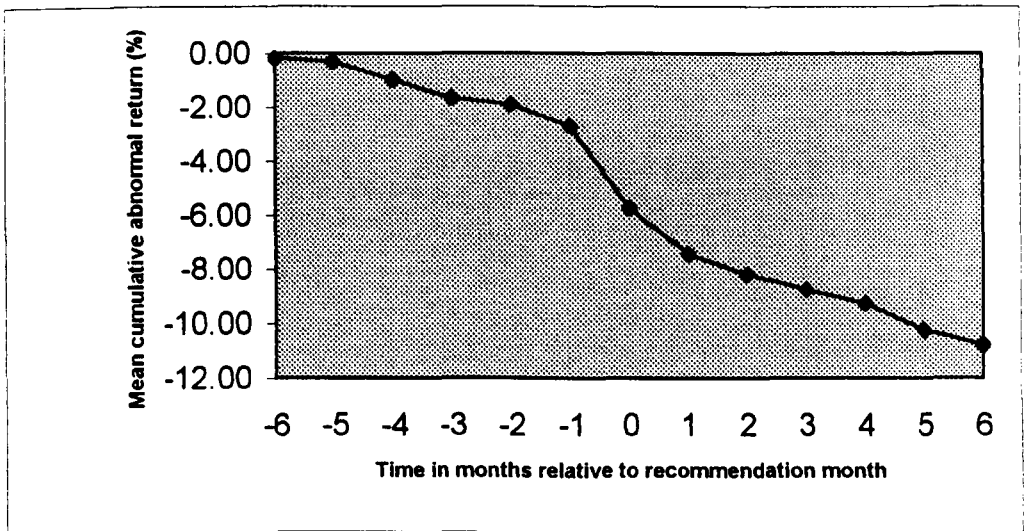
Figure 3

Mean Cumulative Abnormal Returns Surrounding New Buy Recommendations: Base Date Month -1.
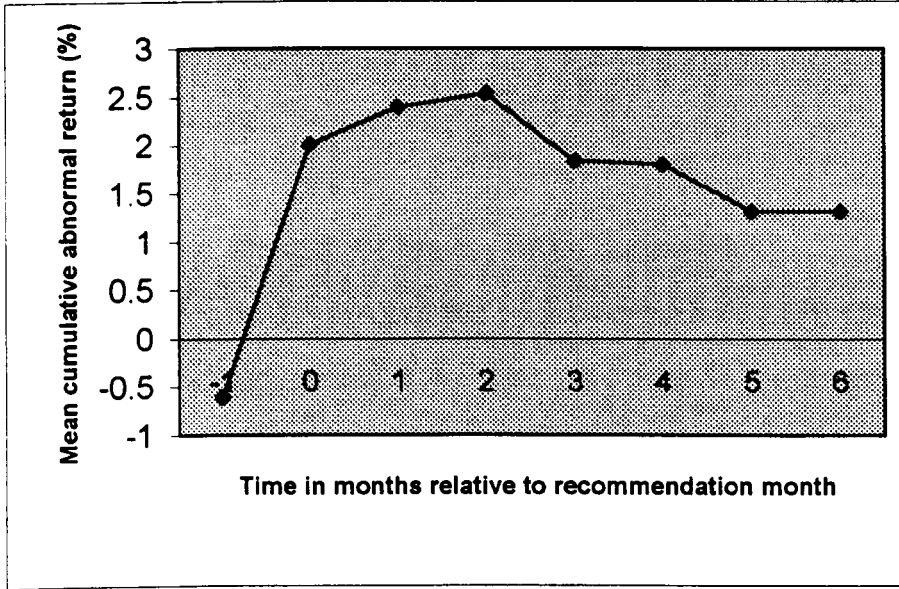
Figure 4

Mean Cumulative Abnormal Returns Surrounding New Sell Recommendations: Base Date Month -1.
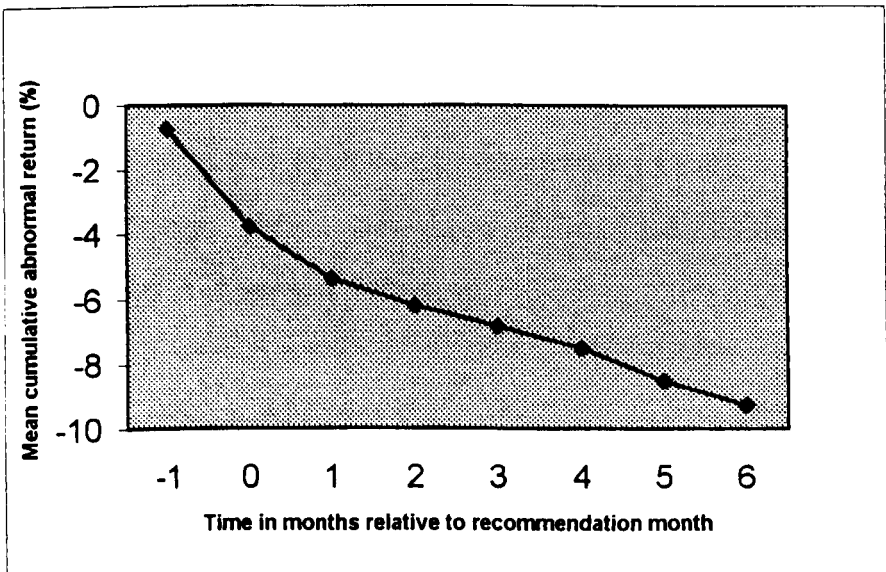
3.7.1 Return Performance of New Buy and Sell Recommendations

The abnormal return for new buy recommendations is +2.6% and the return for new sell recommendations is -3.1% in the month of the recommendation change.

The magnitude of our abnormal returns, at the time of the recommendation change, is comparable with Womack (1996). He found a three day abnormal return of + 3% for new buys and –4.7% for new sells.

Our results, however, exceed those discovered by Elton, Gruber and Grossman (1986), who find smaller calendar month excess returns of +1.9% for new buys and -0.5% for new sells, and Stickel (1995) who finds abnormal returns of +1.1% (new buys) and -1.2% (new sells) for eleven day event windows.

Groth , Llewellen, Schlarbaum, and Lease (1979) document a calendar month return of 1.8% for buys and –1% for sells.

For new sell recommendations we document small negative abnormal returns in each of the six months prior to the month of the recommendation change, although in three of these months these abnormal returns are statistically, albeit not economically significant.

Womack (1996) and Stickel (1995) also document negative abnormal returns in the period preceding the recommendation change though only Stickel finds his returns are statistically significant. However, Stickel's results need to be interpreted carefully as his sample of recommendations,

as described above in section 3.2.5, is derived from stockbrokers' circulars and, therefore, there are potential timing problems as to when the actual recommendation was released to the market. This potential confounding problem does not arise with our sample.

However, Groth, Llewellen, Schlarbaum, and Lease (1979) observe no statistically significant residuals prior to sell recommendations.

For new buy recommendations, we find no evidence of price following behaviour in the months preceding the recommendation change. In fact returns are negative in all of the preceding six months and are statistically significantly negative in four of those months. No previous research study has documented such a finding.

Groth et al, in comparison, find positive and statistically significant returns in the six-month period prior to buy recommendations. They suggest that for buy recommendations:

" Those happy circumstances were accompanied by a series of favourable news items disseminated through normal press channels to the investment community. The digestion of these items induced modest upward revisions in investors' expectations about the prospects of the companies involved, the responses to which are visible in the superior investment results during the pre-recommendation months.

Perhaps because of this superior performance, the firms in question ultimately caught the attention of the research staff of the brokerage house." (p. 37)

In parallel Dimson and Fraletti (1986) find for the subset of their buy recommendations that represent recommendation changes (sample size

n=132) there is a 2.2% rise in price in the two weeks prior to the recommendation change.

The negative returns for new sell recommendations even though consistent with "price following" behaviour, can be legitimised in other ways that are still consistent with analysts having an informational advantage.

In terms of our results analysts are not "price followers" for buy recommendations. There is nothing in the literature to suggest that analysts are less able to process negative information about companies than positive information. In contrast, the analyst may face incentives not to issue an unfavourable report even though they may have negative information about a company (Francis and Philbrick, 1993; Francis and Soffer, 1997; Womack, 1996).

Though Table 7 shows abnormal returns are statistically significant prior to the analysts issuing a new sell recommendation, their magnitude is much greater in the month of, and subsequent to, the recommendation change than in the preceding months. Thus the negative news circulating about companies prior to the recommendation change may not have been significant enough to justify analysts issuing "costly" sell recommendations (Womack, 1996).

3.7.2 Validity of Abnormal Return Performance

3.7.2.1 The Normal Distribution

To apply the t- statistic for evaluating the statistically significance of the abnormal returns, it is necessary for these to be reasonably normally distributed.

The distribution of new buy recommendation returns had a kurtosis value of 5.6 and skewness of 0.77. The corresponding kurtosis and skewness statistics for the new sell recommendation returns are 2.72 and −0.69 respectively. For the normal distribution to describe correctly the distribution of abnormal returns kurtosis should be less than 3 and skewness should not exceed 1.2.

Both new buy and new sell recommendations are both satisfactory for skewness whereas for kurtosis new buy recommendations are on the high side. This would suggest that a greater proportion of the abnormal returns centre about the mean of the distribution than would be the case if returns were strictly normally distributed.

This is, however, a lesser problem than skewness, the violation of which, if present, would suggest that the abnormal returns are being driven by a few large outliers. However, the evidence suggests that this is not the case.

The skewness and kurtosis statistics for other months in the 13-month event period are comparable to those of the month of the recommendation change.

As a further test of whether our abnormal returns are being driven by a subset of recommendation changes that are outliers we eliminate the top 5% and bottom 5% of the recommendations and find no change to our reported results (See Appendix 1).

3.7.2.2 Multiple Recommendations

Another potential bias is that the abnormal return distribution could be driven by multiple recommendations for the same company by several stockbroking houses simultaneously. An examination of the data, adopting a quite conservative procedure, suggests that this clustering of recommendations does not occur.

We proceed by establishing the number of unique recommendations by eliminating for each company all contemporaneous recommendations of the same type made by more than one brokerage house in the same month of the recommendation change, or in the month before and the month after the recommendation change. This was necessary as the dates of the "summary" books used to identify the date of the recommendation change overlap. We thus adopted a quite conservative procedure.

The results suggest that 92% of the buy recommendations and 94% of the sell recommendations represent unique recommendation changes. In other words there is no evidence of analyst herding behaviour in making their recommendation changes. The lack of evidence of herding is also attributable to the fact that not all the stockbroking houses in our sample follow the same companies. This is particularly the case for the smaller firms in our sample which represent 34% of the new buy recommendations and 26% of the new sell recommendations (Table 4).

Rerunning the test statistics using only the unique recommendation changes did not alter our results. (See Appendix 2).

The possibility exists that reported t- values are upwardly biased due to "event month clustering". This occurs when the recommendation changes are driven by the same "event" in calendar time. Time clustering can result in positive cross-sectional correlation among abnormal returns, thereby lowering the power of statistical tests. Using monthly and daily data, Brown and Warner (1980, 85) show that when returns are adjusted using the market model it makes little difference whether cross-sectional dependence due to time clustering is taken into account. On the other hand, Bernard (1987) provides evidence that market model adjustments do not correct the problem if the sample firms are drawn from the same industry.

For our sample, there is little evidence that the recommendations are being driven by particular industry factors which may induce cross-sectional dependence in abnormal returns. In addition, our sample of recommendation changes are reasonably spread out over the eighteen

month time period of our study and are not "clustered" in particular months. It is immediately apparent from Table 3 that our sample of new buy and new sell recommendations are reasonably diversified across industry, with no industry representing more than 7% of the total number of recommendation changes. We test whether industry covariation is driving the magnitude of the abnormal returns and associated t-statistics by recalculating our results truncating our sample of new buy and new sell recommendations to include only one recommendation change for each Stock Exchange sector in each time period. Thus, for example, if there are say three new buy recommendations in respect of stocks in the *Engineering, Vehicles* sector in January 1995 only one is included in our sample. This is a conservative procedure as it assumes perfect positive correlation between the abnormal returns on stocks in the same Stock Exchange sector in the same time period. Rerunning the results in this fashion does not alter our results (Appendix 3).

In addition, the abnormal returns are not driven by size as the sample of recommendation changes is diversified on a size basis and the size characteristics for the new buy and new sell recommendations are broadly comparable (Table 4).

In addition, there is a close correspondence between the actual companies included in the new buy recommendations and new sell recommendations. 80% of the companies that are the subject of a sell recommendation are also the subject of a buy recommendation during the eighteen-month sample period. The corresponding figure for buy recommendations is 64%. Thus, not only are the sample companies similar in size and industry they are also in many cases the same companies.

3.7.2.3 Return –Generating Model

Another potential challenge to the robustness of our results resides in the possibility that the abnormal returns generated are a function of the return generating model employed. Fama (1976) notes that computation of excess returns suffers from the joint hypothesis that computation of excess returns proceeds from some model of what returns are expected.

Evidence on excess returns is questionable if the expected return-generating model is deemed inappropriate. We argue that since the sample of firm recommendation changes is large and well diversified across time, size and industry controlling for such factors would be unlikely to impact on our empirical results.

3.7.3 Price Response in the Months Following the Recommendation Change

For buy recommendations the evidence is that price reaction takes place in the month of the recommendation and in the immediately following month. The largest return occurs in the month of the recommendation change (+2.6%) with +0.38% occurring in the following month. Though 0.38% is statistically significant it is unlikely to be economically significant as it would probably be swamped by transaction costs.

Womack (1996) similarly documents that abnormal return performance for new buy recommendations continues for just one month after the recommendation change. Elton, Gruber and Grossman (1986) find statistically significant abnormal returns for month 0 and the two subsequent months. Diefenbach (1972) using yearly horizons finds that buys underperform the market by 0.4% but no t-statistics are reported. Bjerring, Lakonishok and Vermaelen (1983) and Groth, Lewellen, Schlarbaum and Lease (1979) find no statistically significant returns in the period subsequent to the recommendation change for buys.

It is difficult to make inferences about Dimson and Fraletti (1986) as no t-statistics are reported and, in any case, they conclude that their returns are not economically significant. They report their CAR to be +0.95% for the 26-week period after the recommendation ranging from a low average return of -0.16% in week 1 to a high of +1.55% in week 24.

Interestingly, we report evidence of a statistically significant price reversal in months 3 and 5. No previous study reports similar results. These results may be consistent with the "price pressure" hypothesis whereby prices rose too much at the time of the recommendation due to excess demand in the marketplace which ultimately reversed itself in subsequent months. The price pressure hypothesis predicts that "expert" analysts' recommendations create temporary buying pressure by naïve investors in the recommended securities. This buying pressure can generate temporary abnormal returns followed by a subsequent return reversal. In this context our results are consistent with those studies reporting on the economic value of the secondary dissemination of analysts' recommendations in newspapers (Liang, 1999; Bauman, Datta, Iskandar-Datta, 1995; Barber and Loeffler, 1993).

On the other hand, for sell recommendations there is evidence of large negative statistically significant returns in each of the subsequent 6 months. This is consistent with Womack (1996). He reports a six- month cumulative abnormal return of –9.1%. Our equivalent abnormal return over the same six- month period is -8.9%.

Elton, Gruber and Grossman (1986) record statistically significant returns for up to two months after the new sell recommendation though these are of smaller magnitude than we report.

3.7.4 Validation of the Post- Recommendation Drift

3.7.4.1 Index Matching

As Dimson and Fraletti (1986) note, a long- term test of performance poses a challenge to event study methodology. This arises because the abnormal return estimated incorporates not only the return which is attributable to the event been investigated but also other firm specific components of the return. Cross- sectional averaging of abnormal returns is designed to neutralise firm specific price fluctuations unrelated to the particular event of interest.

However, these cross-sectional averages of cumulative performance are being averaged over periods which overlap. E.g. if all occurrences of the event take place at the same time, the CARs correspond to performance over a single observation period and firm specific factors will not be neutralised. Thus, for example, if a broker chooses domestic securities which are a hedge against the dollar, favourable performance would be a consequence of one and not a multitude of judgements.

Therefore, they argue

" Given these limitations of the event study methodology, it is clear that the long term CAR measures no more than the difference in performance between an experimental portfolio and a control portfolio. For the results to be meaningful, it is important that the control is matched; that is its constituents should be unaffected by the event but should be otherwise similar to the event securities. " (i.e. in both sector and capitalisation) (p. 154).

This view is also echoed in Elton, Gruber and Grossman (1986).

We believe that the difference in abnormal returns between the buy and sell recommendations in our study is not driven by inappropriate matching with the control portfolio i.e. The FT All Share. This is because both the buy and sell recommendations are similar in terms of index constituents and industry composition (Table 3 and Table 4) but the drift exists for the sell recommendations only.

Another potential explanation of the "post-recommendation" drift may be time varying of beta. In this case the new buy recommendation firms would have to become, on average, more risky (higher beta) over time and the sell firms less risky (lower beta). Our results contained in Table 1 show that the abnormal returns are insensitive to the choice of beta. Thus time varying risk does not explain the differences in the drift process for the new buy and sell recommendations.

Womack (1996) similarly was unable to attribute his new sell recommendation drift to either risk per se or time varying risk. Our results are also consistent with the literature on the post- earnings-announcement (PEA) drift discussed by Bernard and Thomas (1989). Bernard (1993) rejects possible explanations of the PEA anomaly based on failure to control adequately for risk research design flaws.

Ball (1992) suggests that the evidence " points to the delayed reaction hypothesis". As we report a dichotomy between the length of the drift process for new buy and sell recommendations it can be argued that this delayed reaction hypothesis may be attributable in part to a loss-aversion hypothesis where there is a reluctance to dispose of losers (Shefrin and Statman, 1985; Thaler, 1985). Essentially the argument revolves around "regret" avoidance, whereby investors may resist the realisation of a loss because it stands as proof that their original purchase decision was incorrect. They hang on to their investments in the hope that more favourable news may occur thus mitigating the loss. This explanation

would be consistent with our results where there appeared to be a reluctance on the part of the analyst to respond to bad news as evidenced by the statistically significant negative returns prior to the analysts issuing their new sell recommendations (Womack, 1996).

We asked the directors of research at the participating house for their views on the post-recommendation drift. They suggested that for new sell recommendations institutions are reluctant to sell in the absence of corroborating evidence from other sources. Therefore, there may be a time lag between the recommendation change and any subsequent price movement. The comments of the directors of research are consistent with Thaler (1985) and Shefrin and Statman (1985).

Overall our results are consistent with Womack (1996). However, in contrast to Womack, we find a statistically significant price reversal for new buy recommendations in months 3 and 5, which may be consistent with market overreaction. Interestingly, our results in this regard, parallel the results of research by Easterwood and Nutt (1998) into the accuracy of analysts' earnings forecast revisions. They find that analysts tend to underreact to negative information and overreact to positive information.

3.8 Cross- Sectional Determinants of Recommendation Performance

The determinants of the price performance of recommendations are investigated by cross- sectional regressions of abnormal returns on empirical proxies for variables expected to affect the magnitude of the cumulative abnormal returns (CARs). These variables and their empirical proxies are discussed below.

We construct a cross-sectional regression equation with CAR as the dependent variable. We expect CAR to be a function of firm size, contemporaneous same-sign earnings forecast revision accompanying recommendations, the existence of an investment banking relationship, stockbroking house reputation, and the magnitude of the revision in the recommendation.

CARs are calculated from the date of the recommendation change rather than from month −6 because of the arguments advanced in relation to "price- following" behaviour in section 3.7.1 above.

We employ dummy variables for each of the variables expected to affect performance. We adopt a dummy variable basis rather than a continuous variable basis for the following reasons:

First, certain variables are by their nature qualitative i.e. the existence of an investment banking relationship, stockbroking house reputation and the magnitude of the revision in recommendation.

Second, even for variables that are potentially continuous, such as earnings forecasts, revisions may be discontinuous. For example, for new buy recommendations, 38% have a positive contemporaneous earnings forecast revision, 50% have no earnings forecast revision and, interestingly, 12% have a negative contemporaneous earnings forecast revision. For new sell recommendations, 42% have a contemporaneous negative earnings forecast revision, 48% have no associated earnings forecast revision and 10% have a contemporaneous positive earnings forecast revision. In this context we document a stronger contemporaneous association between same-sign earnings forecast revisions and recommendations than Stickel (1995). He finds that only 16% of buy recommendations and 28% of sell recommendations have same-sign earnings forecast revisions.

Third, dummy variables ease interpretation of the results as they represent the marginal CAR associated with that particular category.

Fourth, we facilitate comparison with Stickel (1995) who employed dummy variables in his cross-sectional determinants of recommendation performance.

Subsections 3.8.1 to 3.8.5 explore the reasons for inclusion, in our cross-sectional regression of determinants of recommendation performance, of our independent variables in more detail. The cross-sectional regression model itself is set out in section 3.9.

3.8.1 Differences in Firms' Information Environments

As we have argued in Chapter 2, smaller firms tend to have less rich information environments and are less closely followed by analysts than their larger counterparts. The implication is that since information about smaller firms is gathered and processed less frequently, then the impact of any single information release is greater.

We would then expect both buy and sell recommendations will have a greater price impact for smaller firms than larger firms.

The variable "SMALLSTX" is set equal to 1 if the firm is not a constituent of the FTSE 100 index and zero otherwise. The coefficient on "SMALLSTX" is hypothesised to be positive for buys and negative for sells. In other words, buy and sell recommendations associated with "small" firms are expected to generate higher abnormal returns than those of FTSE 100 stocks.

3.8.2 Contemporaneous Earnings Forecast Revisions

Francis and Soffer (1997) and McNichols and O'Brien (1996) find that recommendations and earnings forecast revisions both affect share prices and that price reaction to both buy and sell recommendations is enhanced by same- sign evidence from an earnings forecast revision. (The arguments relating to the potential differences in information content between those recommendation changes that are accompanied by a same-sign earnings forecast revision and those that are not, are set out in section 2.7 and related subsections, in particular the discussion on Francis and Soffer, 1997 on page 45).

We would then expect that buy or sell recommendations made contemporaneously with a same- sign earnings forecast revision will have greater price impact than recommendations made without such same- sign evidence.

For new buy recommendations the dummy variable "POSEFR" is set equal to 1 if the buy is accompanied by a positive earnings forecast revision for the current or next accounting year and set equal to zero otherwise.

For new sell recommendations the dummy variable "NEGEFR" is set equal to 1 if the sell recommendation is accompanied by a negative

earnings forecast revision for the current or next accounting year and set equal to zero otherwise.

The coefficient on "NEGEFR" ("POSEFR") is expected to be negative (positive). In other words we expect those sell (buy) recommendations that are accompanied by a same-sign earnings forecast revision should generate larger negative (positive) CARs than otherwise equivalent sell (buy) recommendations that are not accompanied by a same- sign earnings forecast revision.

3.8.3 Existence of Investment Banking Relationship

Dugar and Nathan (1995) argue that in order to preserve their investment banking relationships and to maintain good relations with management analysts will be more likely to issue buy recommendations for clients when they should be holds and will only issue sell recommendations when it is a very strong sell.

The stockbroking houses summary books record the companies with which the houses maintain an investment banking relationship.

We would expect that in cases where the company, which is the subject of a recommendation change, is a corporate client of the stockbroking

house, there is a greater probability that a buy recommendation should in fact be a hold recommendation.

The dummy variable "IB" is set equal to one if the company, which is the subject of the recommendation change, is a corporate client of the stockbroking house and set equal to zero otherwise. The coefficient on "IB" is expected to be negative for new buy recommendations. In other words, we expect that new buy recommendations issued in respect of corporate clients should on average generate lower CARs than new buy recommendations where an investment relationship does not exist.

We did not employ an investment banking dummy variable for new sell recommendations as an investment banking relationship exists for only three new sell recommendations! This latter case, of course, which is less than 1% of the total, is supportive of our proposition on a face value basis.

3.8.4 Stockbroking House Reputation

As argued in section 2.7 of Chapter 2, analysts may have incentives to bias optimistically their investment recommendations and earnings forecast revisions. However, counterveiling forces may mitigate excessive optimism. These include reduced credibility for the firm's

analysts resulting in loss of investor clients and the possibility of lawsuits from dissatisfied investors (Dugar and Nathan, 1995). In addition, evidence from surveys (e.g. Dorfman, 1991) suggests that sell-side analyst compensation depends, inter alia, on an analyst's reputation.

Thus we expect that analysts with a superior reputation will have greater influence than other analysts. Reputation is proxied by reference to the position of the stockbroking house in the *Extel sectoral* rankings. We use the stockbroking house sector ranking concurrent with the period of the recommendation change. For example, the 1995 "Ranking of Investment Analyst Survey" is used as the basis period for those recommendation changes that took place over the year May 1994 to April 1995 as the ranking is based on a survey carried out towards the end of April 1995.

We would expect that buy or sell recommendations made by the firm ranked highest in the Extel sectoral rankings will have greater price impact than recommendations issued by the other houses in our sample.

To test this, the dummy variable "HIGHEXTEL" is set equal to 1 if the house ranked highest in the sectoral rankings amongst our participating stockbroking houses, subject to that ranking being at least a 1 or a 2, and zero otherwise.

The coefficient on this variable is expected to be positive for buys and negative for sells. In other words, we expect a larger positive (negative) incremental CAR to be associated with a buy (sell) recommendation made in respect of a company in an industry where the stockbroking house has a higher reputation vis-à-vis recommendations made by other stockbroking houses.

3.8.5 Magnitude of Revision in Recommendation

Revisions in recommendations that skip a rank are expected to have a greater price impact than revisions that do not because of the larger change in expectations. For example, a revision from sell to buy is expected to have a greater price impact than a revision from hold to buy. Similarly, a revision from buy to sell is expected to have a greater price impact than a revision from hold to sell.

We would expect revisions that skip a rank to have greater price impact than revisions that do not skip a rank.

To test for this, for new buy recommendations, the dummy variable "STRONG" is set equal to 1 if the change in recommendation is to a buy from a sell and zero otherwise. For new sell recommendations, the variable "STRONG" is set equal to 1 if the change in recommendation is from a buy to a sell recommendation and zero otherwise.

3.9 Experimental Design and Results

The following regression is estimated for new buy recommendations:

$$CAR_{(t,t+s)} = \beta_0 + \beta_1 \text{ SMALLSTX} + \beta_2 \text{ POSEFR} + \beta_3 \text{ IB}$$
$$+ \beta_4 \text{ HIGHEXTEL} + \beta_5 \text{ STRONG} + \varepsilon \qquad (6)$$

For new sell recommendations the equation is the same except for the IB variable and that NEGEFR is substituted for POSEFR.

The regression for new sell recommendations is:

$$CAR_{(t,t+s)} = \beta_6 + \beta_7 \text{ SMALLSTX} + \beta_8 \text{ NEGEFR} + \beta_9 \text{HIGHEXTEL}$$
$$+ \beta_{10} \text{ STRONG} + \varepsilon \qquad (7)$$

where

$CAR_{(t,t+s)}$ = the cumulative abnormal return to the stock from event month t to t+s.

SMALLSTX = a dummy variable set equal to 1 if the company is not a constituent of the FTSE 100 index and zero otherwise

POSEFR = a dummy variable set equal to 1 if the new buy recommendation is accompanied by a positive earnings forecast revision for the current or next year and set equal to zero otherwise

NEGEFR = a dummy variable set equal to 1 if the new sell recommendation is accompanied by a negative earnings forecast revision for the current or next year and set equal to zero otherwise

IB = a dummy variable set equal to 1 if the company which is the subject of the new buy recommendation is a corporate client of the stockbroking house and set equal to zero otherwise

HIGHEXTEL = a dummy variable set equal to 1 if the house ranks highest in the sectoral rankings amongst our participating stockbroking houses and set equal to zero otherwise

STRONG = a dummy variable set equal to 1 if for new buy (sell) recommendations the change in recommendation is to a buy (sell) from a sell (buy) and set equal to zero otherwise.

$\beta_0...\beta_{10}$ are regression parameters to be estimated.

The statistical reliability of the incremental CARs relies on the number of observations still remaining in each month after the recommendation change. Table 5 shows the number of recommendations that expire in each month. Tables 8 and 9 below separate out the number of recommendations remaining decomposed by their dummy variable characteristics for new buy and new sell recommendations respectively.

The interpretation of the results for recommendations that skip a rank needs to be interpreted carefully particularly as the initial sample size is small (n= 28 for both new buy and new sell recommendations). In addition, by the end of the sixth month after the recommendation change there are only 15 recommendation changes from sell to buy and 19 recommendation changes from buy to sell remaining.

Table 8

New Buy Recommendations:

Number of Observations Remaining for Each Dummy Variable in Each Month Following the Recommendation Change

Dummy variable	Month of Recommendation Change	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
SMALLSTX	667	641	604	570	547	516	467
POSEFR	343	332	308	290	275	256	234
IB	164	159	148	139	131	121	115
HIGHEXTEL	323	310	279	257	240	225	202
STRONG	28	25	22	21	20	18	15

Table 9

New Sell Recommendations:

Number of Observations Remaining for Each Dummy Variable in Each Month Following the Recommendation Change

Dummy variable	Month of Recommendation Change	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
SMALLSTX	264	252	225	205	195	179	163
NEGEFR	166	159	145	131	122	114	105
IB	3	3	3	3	3	3	3
HIGHEXTEL	125	114	96	85	77	70	59
STRONG	28	26	25	23	20	20	19

Table 10 and Table 11 report the results of the regression equations for the new buy and new sell recommendations respectively. Although the tests of the hypotheses result in statistically significant evidence that is also economically significant, the percentage of the variation in stock returns explained by these regressions is low. The mean adjusted R^2's are approximately 1% for new buys and 6% for new sells. However, even these low figures compare favourably with Stickel (1995), the only comparable study, who reports an R^2 of 1% for new buy and new sell recommendations.

Table 10

Determinants of Stock Price Performance of New Buy Recommendations

Independent Dummy variable	Predicted Sign	CAR(0,0) Mean Coefficient	t-Statistic	CAR(0,1) Mean Coefficient	t-Statistic	CAR(0,2) Mean Coefficient	t-Statistic	CAR(0,3) Mean Coefficient	t-Statistic
Intercept	?	2.08	4.48***	1.84	3.10***	1.72	2.50***	0.66	0.85
SMALLSTX	+	1.29	2.21**	0.76	1.02	1.34	1.55	1.17	1.19
POSEFR	+	0.71	1.26	1.77	2.47**	1.97	2.38**	1.97	2.09**
IB	-	-0.04	-0.06	-0.05	-0.06	-0.17	-0.16	-0.11	-0.08
HIGHEXTEL	+	-0.75	-1.31	0.20	0.28	0.20	0.23	1.07	1.12
STRONG	+	3.46	2.24**	4.00	2.02**	4.04	1.76*	7.50	2.89***
Adjusted R^2 (%)		0.93		0.76		0.74		1.27	
No. of Observations		901		869		802		749	

*** = statistically significant at α=0.01 (two-tailed test)
** = statistically significant at α=0.05 (two-tailed test)
* = statistically significant at α=0.10 (two-tailed test)

Table 10 (Continued)

Determinants of Stock Price Performance of New Buy Recommendations

Independent Dummy Variable	Predicted Sign	CAR(0,4)		CAR(0,5)		CAR(0,6)	
		Mean Coefficient	t-Statistic	Mean Coefficient	t-Statistic	Mean Coefficient	t-Statistic
Intercept	?	0.34	0.40	0.04	0.04	-0.11	-0.12
SMALLSTX	+	1.15	1.07	0.63	0.54	0.46	0.39
POSEFR	+	1.90	1.85*	1.40	1.25	1.88	1.68*
IB	-	-0.41	-0.31	-0.66	-0.46	-0.55	-0.39
HIGHEXTEL	+	1.85	1.77*	2.49	2.20**	2.31	2.03**
STRONG	+	10.23	3.60***	11.2	3.64***	14.1	3.36***
Adjusted R^2 (%)		1.89		1.83		1.65	
No. of Observations		708		663		611	

*** = statistically significant at $\alpha=0.01$ (two-tailed test)
** = statistically significant at $\alpha=0.05$ (two-tailed test)
• = statistically significant at $\alpha=0.10$ (two-tailed test)

Table 11

Determinants of Stock Price Performance of New Sell Recommendations

Independent dummy variable	Predicted Sign	CAR(0.0)		CAR(0,1)		CAR(0,2)		CAR(0,3)	
		Mean Coefficient	t-Statistic	Mean Coefficient	t-Statistic	Mean Coefficient	t-Statistic	Mean Coefficient	t-Statistic
Intercept	?	-1.16	-1.32	-1.72	-1.57	-1.83	-1.52	-1.94	-1.45
SMALLSTX	-	-1.38	-1.55	-3.37	-3.01***	-4.63	-3.79***	-5.03	-3.69***
NEGEFR	-	-3.17	-3.78***	-3.13	-2.98***	-3.00	-2.62***	-3.50	-2.74***
HIGHEXTEL	-	0.93	1.04	1.59	1.43	1.43	1.18	1.40	1.03
STRONG	-	1.29	0.79	1.83	0.90	3.46	1.56	3.81	1.54
Adjusted R^2		3.82		4.27		5.13		5.09	
No. of observations		398		378		339		310	

***= statistically significant at $\alpha=0.01$ (two-tailed test)
** = statistically significant at $\alpha=0.05$ (two-tailed test)
* = statistically significant at $\alpha=0.10$ (two-tailed test)

Table 11 (Continued)

Determinants of Stock Price Performance of New Sell Recommendations

Independent dummy variable	Predicted sign	CAR(0,4)		CAR(0,5)		CAR(0,6)	
		Mean Coefficient	t-Statistic	Mean Coefficient	t-Statistic	Mean Coefficient	t-Statistic
Intercept	?	-1.15	-0.80	-1.40	-0.92	-0.39	-0.23
SMALLSTX	-	-6.50	-4.41***	-8.18	-5.29***	-9.83	-5.82***
NEGEFR	-	-3.63	-2.62***	-3.27	-2.25**	-3.90	-2.46**
HIGHEXTEL	-	0.44	0.30	1.05	0.68	0.66	0.39
STRONG	-	4.13	1.54	3.42	1.22	1.82	0.59
Adjusted R^2 (%)		6.05		7.57		8.74	
No. of observations		291		272		247	

*** = statistically significant at α=0.01 (two-tailed test)
** = statistically significant at α=0.05 (two-tailed test)
* = statistically significant at α=0.10 (two-tailed test)

3.9.1 Differences in Firms' Information Environments

The results from Table 10 for new buy recommendations suggest that the CARs for SMALLSTX are 1.29% higher (t- statistic =2.21) than their larger counterparts at the time of the recommendation change (month 0). Thereafter, though the coefficients are in the expected direction they are not statistically significant.

The results for new buy recommendations are not surprising as the results of Table 6 suggest that the market impact of buy recommendations is

impounded by the end of the first month after the recommendation change and, thereafter, there is evidence of price reversal. If this is the case it seems reasonable that the differential CAR attributable to "SMALLSTX" should dissipate after month one.

As the differential CARs are not statistically significant we can conclude that the price reversal observable from Table 6 pertains to both the larger FTSE 100 stocks and their "smaller" counterparts in the FTSE Mid 250 and below.

Our results contrast with Stickel who documents that the incremental CARs associated with new buy recommendations for smaller stocks continues for at least 120 days after the recommendation change. 120 days is the outer horizon of his event period. He concludes that the market is slow to assimilate the information in buy recommendations for smaller firms.

For sell recommendations we find that SMALLSTX generate higher CARs for the month of the recommendation change and in each of the succeeding 6 months compared to their larger counterparts. The marginal CAR at the time of the recommendation change is −1.38% (t- statistic =1.55) and thereafter continues to grow monotonically and is statistically significant. Stickel's results for new sell recommendations show that the incremental CAR is neither in the expected direction or statistically significant.

Other studies on the market impact of brokers' recommendations are not comparable as they do not condition on size.

In summary, we find that the price response to recommendations is greater for "small" firms than for "large" firms, which is consistent with the information environment literature. In addition, there is a statistical difference in the post- recommendation drift conditioning on firm size i.e. smaller firms tend to generate bigger drifts than their larger counterparts. This is consistent with Lo and MacKinlay (1988) who document small firms exhibit greater short run price inertia than larger firms.

Our results contrast with Stickel who only finds evidence of a differential response for buy recommendations. However, in interpreting Stickel's results, we need to be mindful of the potential methodological concerns we raised in respect of his study in section 3.2.5 above.

3.9.2 Contemporaneous Earnings Forecast Revisions

New recommendations have greater price impact if reinforced by a corroborating earnings forecast revision. New buy recommendations with an associated positive earnings forecast revision are associated with an incremental abnormal return of 0.71% (t-statistic =1.26), at the time of the recommendation change, compared to those buy recommendations that were either accompanied by no associated earnings forecast revision or a negative earnings forecast revision.

In the following month the incremental CAR is 1.77% (t-statistic = 2.47). The CAR remains in expected direction and statistically significant thereafter with the exception of CAR (0,5).

In contrast to our results for firm size where the differential CAR disappears in a statistical sense after month one, the incremental CAR associated with a contemporaneous positive earnings forecast revision issued with a buy recommendation continues to be significant up to the six month horizon of our study.

New sell recommendations with an accompanying negative earnings forecast revision have a –3.17% (t-statistic =3.78) incremental CAR at the time of the recommendation change in comparison with those sell recommendations that either had no earnings forecast revision or a positive earnings forecast revision. The incremental CAR remains statistically significant for the entire 6-month horizon.

Our results are consistent with Stickel (1995) and Stickel (1991) who found that positive abnormal returns follow positive earnings forecast revisions and negative abnormal returns follow negative earnings forecast revisions for approximately six months.

Our results are consistent with Francis and Soffer (1997) who argue that recommendations and earnings forecast revisions both affect share prices and that the price reaction to both buy and sell recommendations is enhanced by same-sign evidence from an earnings forecast revision.

Our results can also be compared with the post- earnings announcement drift (PAD) literature (e.g. Bernard and Thomas, 1989).

The UK evidence on the PAD documented by Hew, Skerratt, Strong and Walker (1996) suggests that there is only evidence of a PAD for smaller firms. In contrast we find evidence of PAD for both large and small firms. It must be noted, however, that our results are not strictly comparable to the PAD literature. This is because we deal with analysts' earnings forecast revisions that accompany their recommendations and not the earnings announcement per se which is the focus of the PAD literature.

3.9.3 Existence of Investment Banking Relationship

Our results for the impact of an investment banking relationship on the magnitude of the CARs are contrary to expectations.

We expected that new buy recommendations for companies that are corporate clients of the stockbroking house should have negative differential CARs. In other words, we expected new buy recommendations issued in respect of corporate clients, on average, to underperform new buy recommendations where no investment banking relationship exists.

We find that whilst the coefficients are in the expected direction for all time periods they are not statistically significant or even close to being significant.

In this regard our results are similar to those reported in Dugar and Nathan (1995). They find that the difference between the market reaction to recommendations where an investment banking relationship exists and where it does not exist is in the expected direction but is not statistically significant.

They argue that this may be attributable to their data source. They use brokerage reports from Investext as the source of their recommendation change. This creates a potential problem as the brokerage house reports were, in all probability, distributed orally to institutional investors prior to the written report.

Our data does not suffer from this potential bias. We know the exact month of the recommendation change and find that there is no statistically significant differential CAR between those recommendations where an investment banking relationship exists and where it does not.

Our results appear to suggest that analysts at least for buy recommendations do not appear to bias optimistically their recommendations where an investment banking relationship exists.

This may be because of a counterveiling force that mitigates excessive optimism. An optimistic buy recommendation whilst satisfying the corporate client may reduce credibility for the analyst in the eyes of institutional investors resulting in loss of institutional loyalty and or lawsuits for potentially misleading recommendations.

Stickel does not include a dummy variable for the existence of an investment banking relationship in his regressions on the cross sectional determinants of recommendation performance, so we cannot compare our results to his.

A stronger test would have been for new sell recommendations but, as pointed out in section 3.8.3 above, these are conspicuous by their absence!

3.9.4 Stockbroking House Reputation

The results suggest that contrary to expectations high stockbroking house reputation as proxied by the Extel sectoral rankings does not have any statistically significant on the CARs for new sell recommendations.

Interestingly, for new buy recommendations the coefficients of the incremental CARs are positive except in the month of the recommendation change thus suggesting that there is a positive incremental CAR between those buy recommendations that are issued by houses with the highest Extel sectoral rankings and those buy recommendations issued by other houses.

However, the coefficients are not statistically significant until CAR (0,4) to CAR (0,6). CAR (0,4) suggests that there is a +1.85% (t-statistic =1.77) incremental CAR attributable to those new buy recommendations

that rank highest in the sectoral rankings over those that do not. The corresponding incremental CARs for CAR (0,5) and CAR(0,6) are +2.49% (t-statistic =2.20) and +2.31% (t-statistic=2.03) respectively.

These results suggest that for new buy recommendations it takes the market some time to distinguish between those buy recommendations that have superior investment value and those that do not.

Our results, suggesting a differential impact of stockbroking house reputation on new buy and sell recommendations, are consistent with the arguments advanced by Francis and Soffer (1997) reviewed in Chapter 2. They argue that buy recommendations are, on average, less informative than sells as the analyst's environment encourages issuance of favourable information about firms. Therefore, stockbroking house reputational differences are more likely to be captured in the market's response to new buy recommendations than in the market's response to new sell recommendations.

Other studies that compare the performance of recommendations across stockbroking houses generally conclude that a superior stockbroking house cannot be identified.

Elton, Gruber and Grossman (1986) find no evidence that amongst their sample of 727 recommendations from 33 stockbroking houses that a superior stockbroking house can be identified or that one stockbroking house is consistently better than the others.

Dimson and Marsh (1984) evaluate 4187 share price forecasts made by 35 UK brokers during the calendar year 1980-1981. They find that

differences in the forecasting ability between brokers do not appear to persist over time.

Stickel finds that for sell recommendations brokerage reputation as measured by their ranking on the II All American Research Team (the US equivalent of the Extel ranking) has no effect on differential CARs. However, for new buy recommendations he find a positive incremental CAR of 1.18% (t-statistic =2.55) at the time of the recommendation change but, for all subsequent periods the effect disappears suggesting that the reputation effect is short lived.

Our results are consistent with Stickel (1995), Dimson and Marsh (1984), and Elton, Gruber and Grossman (1983) for sell recommendations.
In contrast to Stickel we find that for new buys, rather than being short lived, the effect of superior reputation takes longer to be absorbed and appears to be permanent, or at least lasts out to the 6 month horizon of our study.

3.9.5 Magnitude of Revision in Recommendation

As expected new buy recommendations that were originally sell recommendations generate higher incremental CARs than new buy recommendations that were originally hold recommendations.
The incremental CAR in the month of the recommendation change is +3.46% (t-statistic =2.24) vis-à-vis those firms where the revision was from a hold to a buy.

It increases to 11.1% (t- statistic =3.64) for CAR (0,5) and to 14.1 (t-statistic =3.36) for CAR (0,6). However, these results must be interpreted cautiously as there are only 15 observations remaining in the 6th month after the recommendation change.

In contrast for new sell recommendations there is no statistically significant differential CAR conditioning on whether the new sell recommendation was originally a buy recommendation or a hold recommendation.

Therefore, our results are broadly consistent with Stickel but we must interpret our results cautiously as the sample sizes are small.

3.10 Summary and Conclusions

Our research into recommendation changes made by UK sell-side analysts indicate that share prices are significantly influenced by analysts' recommendation changes, not only at the time of the recommendation change but also in subsequent months.

There is little evidence of "price following" behaviour for buy recommendations. For sell recommendations we find some evidence of

"price following" behaviour but we rationalise it as attributable to causes other than simply "price following".

The price reaction to new sell recommendations is greater than the price reaction to new buy recommendations. We argue that this is associated with the potential costs of disseminating rather than gathering information per se. As new sell recommendations are less frequent and more visible an incorrect judgement on a sell recommendation is likely to be more costly to reputation than an incorrect buy recommendation when other analysts are likely to be making similar recommendations. Thus if the costs of issuing a sell recommendation are greater, then the analyst's expected return for issuing them will be greater as well.

Even though the immediate price reactions are large, they appear to be incomplete showing considerable post- recommendation drift particularly for sell recommendations. We find that post- recommendation drift which appears analogous to the post- earnings announcement drift is not explained by a failure to control adequately for risk and hence may be suggestive of a delayed reaction hypothesis (Ball, 1992).

In addition, we find that the magnitude of the abnormal returns generated by new buy and sell recommendations is influenced cross-sectionally by factors associated with a firm's information environment and the incentives literature. In particular we find that higher abnormal returns are generated by recommendations in respect of "smaller" firms and in circumstances where a contemporaneous same-sign earnings forecast revision accompanies the recommendation change and for those recommendation changes that skip a rank.

Analysts incur costs in acquiring, processing, and disseminating information to their clients. The issuance of new buy and sell recommendations has a substantial impact on prices both immediately and in subsequent months. The returns generated are consistent with Grossman and Stiglitz (1980) who argue that valuable information gathering should generate a return.

In the next chapter we evaluate the role of the analyst in "relative" terms. We have shown that analysts' recommendations have investment value to the market. However, they may explain such a small proportion of company price movements that recommendations rank secondary to other more valuable information releases. In other words, how do analysts' recommendations and earnings forecast revisions rank relative to other categories of news that are released continuously throughout the financial year e.g. preliminary announcement, takeovers, management- related announcements etc. in explaining company price changes and trading volume movements. If analysts' recommendations and earnings forecast revisions explain only a small proportion of companies price changes during the course of a year the economic value of the analyst may be limited. This is despite the fact we have shown that the market values analysts' recommendations and earnings forecast revisions.

CHAPTER 4

"RELATIVE" VALUE OF SELL-SIDE ANALYSTS' RECOMMENDATIONS AND EARNINGS FORECAST REVISIONS IN DRIVING MARKET-ADJUSTED COMPANY SHARE PRICE CHANGES AND TRADING VOLUME MOVEMENTS

4.1 Introduction

In this chapter we evaluate the "relative" value of sell- side analysts' recommendations and earnings forecast revisions. Our results from the

last chapter suggest that sell- side analysts' recommendations have investment value in an "absolute" sense. We also demonstrate that the market responds to same- sign earnings forecast revisions, issued contemporaneously with investment recommendations.

No existing research addresses the "relative" value of analysts' recommendations and earnings forecast revisions vis-à-vis other firm information sources in explaining stock specific returns during the course of a financial year. Such other information sources may include preliminary earnings announcements, interim earnings, AGMs, dividends, takeover bids, capital structure changes, trading in large blocks of shares, notifications of insider dealings, management changes, new product announcements etc.

We are concerned specifically in this chapter with how the price and/ or trading volume impact of analysts' recommendations and earnings forecast revisions compare with other categories of news that are released continuously throughout the financial year.

We assess the "relative" significance of analysts' recommendations and earnings forecast revisions vis-à-vis other categories of news in explaining company-specific price changes and trading volume movements for 215 London Stock Exchange companies over the two-year period 1st January, 1994 to 31st December, 1995.

The extant literature on the relationship between firm information and price/ trading volume activity gives prominence to a firm's accounting releases in explaining company price changes and trading volume activity. However, accounting releases only take place at fixed intervals throughout the financial year and we argue that much of the information content of these releases will be anticipated by the market and communicated via more timely sources.

We argue that the sell-side analyst will play a major role in keeping the equity markets informationally efficient. The competitive advantage of the analyst may derive either from their superior information processing skills (Merton, 1987) and/or from their preferential access to "private" information (Holland, 1998). In chapter 2 we show that the degree of analyst following is a critical component of a firm's information environment and that investors demand a risk premium, in terms of an increased return, for investing in stocks not closely followed by the community of investment analysts. Merton (1987) argues that the higher returns attributable to such factors as low P/E, may be associated with compensation for reduced information availability. In this context the pivotal importance of the analyst as a key component of a firm's information environment is suggested by the dominance of analyst neglect over stock market anomalies namely size, low P/E and the January seasonal in explaining returns (Arbel, 1985).

As such we hypothesise that the size of (proxying for information content) of the price/ trading volume activity generated, will be larger for analysts' earnings forecast revisions and investment recommendations than for all other information events, including a firm's accounting information.

No extant research on the market's response to analysts' investment recommendations investigates explicitly whether any price / trading volume activity apparently triggered by analysts' investment recommendations may, in fact, be triggered by other contemporaneous news announcements and not analysts' recommendations per se. Thus analysts may be "information followers" and may simply be piggybacking on publicly available information releases e.g. analysts issuing a buy recommendation on the same day as a company announces unexpectedly favourable preliminary results. We explicitly control for this possibility in our methodological design.

The next section 4.2 reviews earlier work on the relationship between company information flows and related share price and trading volume activity. The following section places our work within the existing corpus and highlights our original contribution. Section 4.4 develops our hypotheses and the next section describes our methodology and data. Section 4.6 presents our empirical results. A summary and conclusion of our findings are provided in the final section of the chapter.

4.2 Relationship between Firm- Specific Information Flows and Share Price Performance and Trading Volume Movements

4.2.1 Importance of Accounting Information

Arguably, the most important company news releases relate to firms' accounting releases (interim results, preliminary results, annual report and accounts).

The seminal study on the information content of the annual earnings announcement is Ball and Brown (1968). They demonstrate that the annual earnings announcement has information content as measured by the price response at the time of the release of the annual earnings.

Firth (1981) examines the information content of the annual results, interim results and the annual report and accounts using UK data. He examines both the price and trading volume impact of these announcements for 120 companies using weekly data. His results demonstrate that, on average, firms' highest price and trading volume residuals are associated with the preliminary results (PA), interim report (IR) and annual report and accounts (ARA) respectively, thus suggesting that they are the most important sources of company news.

Rippington and Taffler (1995) extend Firth's (1981) study by using daily data. Their sample consists of 337 UK companies. Their results confirm

the results of Firth in that the highest absolute price residuals are associated with the PA and the IR.

However, a potential weakness of the methodology adopted by both Firth and Rippington and Taffler is, that in ranking their absolute return residuals, they do not explicitly take into account company news categories other than accounting releases. They simply calculate the average absolute return residuals associated with accounting releases and compare these to the average residuals generated, across their sample, for all other days during the course of the financial year. Thus those days on which valuable information is released are averaged with days on which little or no information is released, thus potentially concealing valuable information and biasing upwards the price residuals associated with firms' accounting releases.

A better approach to assess the relative value of formal accounting information releases would be to include other potentially valuable news event categories, in addition to a firm's accounting releases, and compare the abnormal returns.

We specifically address this issue in our study, as we argue that a firm's accounting releases, though valuable, are not a timely medium and that the market will anticipate much of the information content of such releases. Such anticipation will be reflected in the investment recommendations and earnings forecast revisions of the sell-side analyst to which the market will react.

In their seminal study, Ball and Brown (1968) argue that the market anticipates much of the information content of a firm's accounting releases days, weeks and even months prior to the actual announcement date. They investigate the timeliness and information content of the annual earnings announcement. Using the market model and monthly price data for a sample of 261 firms quoted on the NYSE they show that the market reacts to the earnings announcement up to 11 months prior to the announcement and continues to react for a period of approximately one month after the announcement.

They conclude that 85% to 90% of the annual earnings announcement is captured prior to the date of its actual release. On this basis the annual earnings announcement has value but they question its timeliness:

" *However the annual report does not rate highly as a timely medium since most of its content is captured by more prompt media which includes interim reports.*" (p. 176)

This view of the lack of timeliness of a firm's accounting disclosures is consistent with the findings of the literature on the earnings response co-efficient (Beaver, Lambert, and Morse, 1980; Beaver, Lambert, Morse and Ryan, 1987; Kothari, 1992; Kothari and Sloan, 1992 and Donnelly and Walker, 1995). Interestingly, Donnelly and Walker, using UK data and a similar methodology to Kothari and Sloan, report that the extent to which prices anticipate earnings in the UK is less than that reported in the US. They do not specifically address the reasons for this difference, but speculate:

"In general, the effect could be due to differences in the information environment, or it could be due to differences between UK and US GAAP." (p. 14)

A key question is what other news categories contain information anticipating the information content of accounting disclosures, and hence trigger price and trading volume activity, prior to the formal release of the accounting results? In addition, are the information releases themselves the ultimate triggers of the market's response, or, alternatively their interpretation by the analyst?

We argued in Chapter 2, in our discussion of Merton's (1987) model of capital market equilibrium in the presence of incomplete information, that the analyst may play a significant role in interpreting such information releases, particularly those of a complex nature.

In addition, some information that may affect the accounting results may not become "publicly" available through conventional sources. In these circumstances, analysts may play a role in informing the market of this potentially valuable information. A potentially valuable source of information to the analyst is access to company management (Pike, Meerjanssen and Chadwick, 1993) who also have incentives to communicate certain types of information directly to a subset of analysts rather than to the market as a whole (Holland, 1998).

In the next section, we review those studies that seek to establish the relationship between a set of potentially more timely news releases and company price movements and trading volume activity. We argue that these studies have potential deficiencies associated with them. In particular, they do not give prominence in their information event

classification schemes to the role of the analyst in explaining price and/or trading volume activity.

4.2.3 Relationship between Company Price Changes and Trading Volume Movements and a "Comprehensive Set" of News Announcements

We have argued that the lack of timeliness of a firm's accounting releases means that their information content may be incorporated into the share price by more timely news sources.

Studies have documented the market impact of other types of firm specific news that are released continuously throughout the financial year such as takeover bids, rights issues, dividends, trading in large blocks of shares, notifications of insider dealings, management changes, stockbrokers recommendations and earnings forecast revisions, managers' profit forecasts etc.

On the other hand, studies looking at the information content of a more "comprehensive set" of possible events of a firm specific nature are relatively few in number. Only three studies document the effect of a more comprehensive set of news announcements of company price and/or trading volume activity (Brookfield and Morris, 1992; Thompson, Olsen and Dietrich, 1987 and Morse, 1982a).

The motivation for these studies is that previous research examines the impact of various firm specific news releases in isolation, without regard to their relative importance vis-à-vis one another.

All three studies start with a priori categories of news announcements and investigate whether they have information content in terms of abnormal price and/or trading volume response at the time of the release of the news to the market.

Their classification schemes consist of 16, 12, and 9 news categories respectively. The detailed news categories employed in these studies are set out in Appendix 4.

In each case the proxy for the time of release of news to the market is its publication date in the financial press. The US studies, Thompson, Olsen and Dietrich (1987) and Morse (1982a), use the publication date in the Wall Street Journal (WSJ) index. Brookfield and Morris (1992), using UK data, take the McCarthy Information fiche service as their information source and newspaper article publication date as the information release date.

Typically company earnings announcements are employed as the benchmark and the market impact of other news announcements is established relative to the earnings announcement. Each of the three studies concludes that earnings announcements (annual, interim, and quarterly) convey the most value relevant information to the market. Other categories of news announcements generally have lower information content.

Brookfield and Morris (1992) is the only UK- based study and though it incorporates analysts' recommendations and earnings forecast revisions, these are amalgamated with forecasts and recommendations made by the newspapers themselves. Thompson, Olsen and Dietrich (1987) also consider sell-side analysts earnings forecasts but only as part of a category that also includes management forecasts. Morse (1982a) does not include analysts' investment recommendations or earnings forecast revisions as information events.

4.3 Our Contribution to the Literature

Extant work, as indicated above, does not give adequate prominence to the sell-side analyst. Our original contribution to the literature is that this chapter reports on the first true test of the relative importance of the sell-side analyst in the equity markets. Specifically, though we also address, the relationship between a "comprehensive set" of news release and company price and trading volume behaviour, we explicitly include sell-side analysts' investment recommendations and earnings forecast revisions as a separate information event category.

In addition, we adopt an appropriate methodology for comparing the "relative" value of various company information releases to the market.

Our approach has a number of advantages over the traditional event study methodology used in earlier work.

Extant research on the market's response to sell- side analysts' investment recommendations does not explicitly control for other contemporaneous news releases. Thus analysts may simply be changing their investment recommendations or revising their earnings forecasts at the same time as the market is responding to newly released company specific information. We specifically exclude all such investment recommendations from our study.

In addition, we separately consider the relationship between company-specific news categories and trading volume activity. There are arguably different interpretations associated with the price and the trading volume response to an "event". Price movements reflect a change in the market's consensus expectations generated by a news release (Beaver, 1968), whereas trading volume activity reflects changes in expectations of individual investors (heterogeneous expectations) consequent on the news release (Karpoff, 1986; Kim and Verrecchia, 1991). Thus, it is possible that an "event" may trigger a trading volume movement without any corresponding price change if, for example, investors interpret the "event" differently but, on average, the market average opinion does not change.

4.4 Hypotheses

4.4.1 Proportion of Company Market-Adjusted Abnormal Price Changes and Trading Volume Movements Driven by Analysts' Recommendations and Earnings Forecast Revisions

The link between company specific information flows and stock price and trading volume behaviour occupies a central position in the financial economics literature, with particular emphasis being placed on the role of firms' accounting releases. However, we argue that accounting releases, though an important source of company news, are not a timely source, and consequently, much of the news content will be anticipated by more timely news categories and that the activities of the sell-side analyst will play a major role in analysing and interpreting such timely news releases, particularly those of a complex nature (Merton, 1987). In addition the analyst may also act as a conduit for the dissemination of previously "private" information to the market (Fama, 1970; Holland, 1998). Therefore, we expect that analysts' recommendations and earnings forecast revisions will contain valuable information in their own right that will drive a significant proportion of company price changes and trading volume movements.

$H_0 1$: *Analysts' earnings forecast revisions and investment Recommendations, not issued contemporaneously with other firm specific information releases, will not explain a significant proportion of companies' largest market- adjusted price and trading volume movements.*

4.4.2 Relationship between Firm Size and the Proportion of Company Price Changes and Trading Volume Movements Driven by Analysts' Investment Recommendations and Earnings Forecast Revisions

In the last subsection we argue that analysts' recommendation changes and earnings forecast revisions will an important news category in explaining company share price changes and trading volume activity in aggregate across all companies in the FTSE 100 and FTSE Mid 250 indexes. In this subsection, we argue that analysts' earnings forecast revisions and investment recommendations will explain a greater percentage of price and trading volume movements for FTSE Mid 250 stocks where there are fewer incentives for investors and the financial press to gather information (Grant, 1980; Thompson, Olsen and Dietrich, 1987). FTSE Mid 250 stocks are still widely held by institutions (Gaved, 1997), a factor which dominates size in explaining analysts' decisions to follow a stock (O'Brien and Bhushan, 1990). In other words, we argue that the larger FTSE 100 stocks should have rich information environments independently of analyst activity and therefore the analyst will play a larger role in gathering, interpreting, and disseminating information for "smaller" FTSE Mid 250 companies.

$H_0 2$: *There will be no difference in the proportion of companies' major price changes and trading volume movements driven by analysts' recommendations and earnings forecast revisions conditioning on company size.*

4.4.3 Relative Size of the Price (Trading Volume) Movements Associated with Analysts' Recommendations and Earnings Forecast Revisions vis-à-vis other News Categories

Analysts are a critical component of a firm's information environment. (Arbel, Carvell and Strebel, 1983; Arbel, 1985). Merton (1987) argues that the higher returns associated with such factors as analyst neglect, low market capitalisation, low P/E etc may be associated with compensation for reduced information availability. Arbel (1985) shows that the degree of analyst neglect dominates other stock market anomalies in explaining stock returns thus suggesting that the degree of analyst following is the best proxy of the variables tested by Arbel for the richness of a firm's information environment.

Arguably, the most important company news releases relate to firms accounting releases. The information content of such releases is a major issue in the accounting literature (e.g. Ball and Brown, 1968; Beaver, 1968; Firth, 1981; Rippington and Taffler, 1995). We hypothesise that a firm's accounting releases, though valuable, are not a timely source of company information. Much of the information content of such releases will be anticipated by the market, in particular through the investment recommendations and earnings forecast revisions of the sell-side analyst.

On this basis, we hypothesise that the information content of analysts' earnings forecasts and investment recommendations will dominate the

information content of other firm information releases, including accounting releases.

In this subsection we compare the size of the price/ trading volume movements generated by analysts' recommendations and compare them to the size of the price/ trading volume movements generated by the other major news categories. This provides insight into the marginal information content of analysts' recommendations and earnings forecast revisions relative to other information releases. In other words, the larger the price/ trading volume movement the greater the incremental news content of the news category.

$H_0 3$: *The size of the abnormal price changes and trading volume movements (proxies for information content) triggered by analysts' recommendations and earnings forecast revisions will not differ from the size of the price changes and trading volume movements triggered by a firm's accounting releases.*

$H_0 4$: *The size of the abnormal price changes and trading volume movements (proxies for information content) triggered by analysts' recommendations and earnings forecast revisions will not differ from the size of the price changes and trading volume movements triggered by other company news categories.*

4.5 Methodology and Data

4.5.1 Company Selection

Our sample consists of all industrial companies in the FTSE 100 and FTSE Mid 250 indices (excluding financials) for the two- year period 1st January, 1994 to 31st December, 1995.

These are the largest capitalisation stocks in the UK and would be more likely to attract the attention of fund managers, stockbroking analysts and the financial press. Companies outside these indices are likely to have less rich information environments. They are likely to be followed by fewer analysts (O'Brien and Bhushan, 1990), attract less interest from institutional investors (Arbel, Carvell and Strebel, 1983 and O'Brien and Bhushan, 1990), and, importantly from our point of view, receive less coverage in the financial press and company news sources generally (Grant, 1980; Thompson, Olsen and Dietrich, 1987). We explore the relationship between firm size and the incentives for gathering, processing and disseminating information explicitly in Chapter 2.

The original sample consisted of 254 industrial companies was narrowed down to 215 with companies in the original list eliminated for the following reasons:

(1) If share price or trading volume data was not available for the company for the full period 1st, January, 1993 to 31st December, 1995, and/or

(2) The company itself was not in existence for the entire period of the study, or had merged or de- merged.

The sectoral decomposition of the 215 companies in our sample is presented in Table 12.

Table 12

Sectoral Decomposition of Our Sample Companies

Stock Exchange Sector	Number of Companies
Building and Construction	8
Building Materials	15
Chemicals	9
Diversified Industrials	12
Electronic and Electrical	5
Engineering	18
Engineering, Vehicles	3
Printing, Paper and Packaging	6
Textiles	3
Breweries	8
Spirits, Wines and Ciders	3
Food Manufacturers	11
Household Goods	1
Healthcare	5
Pharmaceuticals	2
Tobacco	1
Distributors	7
Leisure and Hotels	6
Media	17
Retailers, Food	6
Retailers, General	17
Support Services	6
Transport	9
Electricity	7
Gas Distribution	2
Telecommunications	3
Water	7
Property	9
Extractive	2
Oil, Integrated	3
Oil, Exploration	4
Total	215

4.5.2 Identification of Abnormal Price Outliers

We adopt an appropriate methodology for comparing the "relative" value of various company information releases to the market.

We identify price and trading volume "outliers" as the independent variables and then determine what company specific news categories, if any, are associated with these "outliers". To identify the price and trading volume outliers we find the largest 5% market- adjusted price and trading volume movements for each of the 215 companies in our sample over the two-year period.

Using this methodology we do not need to generate a list of a priori categories of events expected to generate price and/or trading volume movements. Previous studies such as Brookfield and Morris are open to the possibility that any news releases they do not consider may generate greater price activity than their pre-specified news categories. Our methodology ensures, that insofar as is possible, we have a more complete picture of the news categories driving companies major price changes and trading volume movements. Thus we are not open to the potential criticism that other news categories not taken into account may dominate analysts' recommendations and earnings forecast revisions in explaining company price changes and trading volume activity.

We seek to identify the largest company specific price changes and trading volume movements generated each year for each of the 215

companies in our sample. To do this we need to define the return-generating model and the procedure for identifying "price outliers".

4.5.2.1 Return-Generating Model

We employ the market model with no intercept term to eliminate that component of a company's price movement that is attributable to the market as a whole.

The market model approach is consistent with the methodology employed by Brookfield and Morris (1992) and Morse (1982a). Thompson, Olsen and Dietrich (1987) use raw returns unadjusted for market movements. No intercept term is calculated. The same arguments apply as in Section 3.5.7 of the last chapter.

A prior period beta is used as it represents our proxy of the markets ex ante estimate of a company's market risk for the forthcoming period. In addition, using a contemporaneous beta would mean that the "event period" itself is included in the "estimation period" for beta and thus this beta would be influenced by events occurring within the event period. It is desirable to prevent this simultaneous determination from occurring.

Daily share price data was obtained from FT EXTEL. Daily trading volume data and dividend data were obtained from Datastream International. The Financial Times Actuaries All Share Index is used as the market index.

The abnormal return metric employed is defined as follows:

$$U_{i,t} = AR_{i,t} - ER_{i,t} \tag{8}$$

where

$U_{i,t}$ = the abnormal return associated with company i on day t

$AR_{i,t}$ = actual return for company i on day t

$ER_{i,t}$ = expected return for company i on day t

The expected return generating model is as follows:

$$ER_{i,t} = \beta_i R_{m,t} \tag{9}$$

where

$R_{m,t}$ = return on the FT All Share Index on day t

β_i = LBS beta coefficient for company i

Betas are obtained from the London Business School (LBS) Risk Measurement Service (RMS). We use the company beta estimate from the January-March, 1994 RMS book as our proxy for the market's ex ante estimate of systematic risk for the calendar year 1994. The January-March book is based on share price movements up to and including 31st December, 1993. Similarly, we use the January-March, 1995 book as the corresponding estimate of systematic risk for the 1995 calendar year.

As explained in section 3.5.7 of the last chapter returns are calculated using log prices, adjusted for dividends as follows:

$$\ln(P_t + D_t) - \ln(P_{t-1}) \tag{10}$$

where:

In = natural log

P_t = price in time period t

D_t = dividend in time period t

t = time on a daily basis

We seek to identify the largest company- specific price changes by isolating those market- adjusted price movements that are in excess of two standard deviations from the average residual value. It is expected that these price movements, given their size, should be associated with firm specific news releases and not attributable to noise.

If returns are normally distributed these residuals will lie in the 2 ½ percent tails of the normal distribution. As there are approximately 250 trading days in the year, we will have approximately 12 observations per company per year.

Diagnostic tests confirm that the market model residuals generated can reasonably be characterised as being normally distributed and the residuals fall within acceptable limits for kurtosis (less than 3) and skewness (not exceeding 1.2).

The standard deviations used to identify the residuals are based on the standard deviations from the previous calendar year. Thus, for example the British Telecom price outliers for 1994 are estimated by initially calculating the market- adjusted returns by running the market model for the 1994 period as outlined above. Next, we apply the standard deviations generated from the market model residuals in the 1993 calendar year and identify all residual price movements for 1994 that lie in excess of two standard deviations from the mean residual. (We use 1993 standard deviations to identify the 1994 outliers as the 1993 standard deviations

are our proxy of the market's ex ante measure of British Telecom's market-adjusted price variability in 1994).

4.5.3 Trading Volume Movements

In our study we separately consider the relationship between company-specific news categories and trading volume activity. Morse (1982a) is the only one of the three "comprehensive" studies that considers trading volume but as we previously mentioned he does not treat analysts' recommendations and earnings forecast revisions as one of his news categories.

The following model derived from Morse (1980, 1982a,b), Bamber (1986, 1987) and Ziebert (1990) is used to calculate the market-adjusted trading volume residuals for the 215 firms over the two- year period 1994- 1995.

The abnormal volume metric employed is defined as:

$$\lambda_{i,t} = AV_{i,t} - EV_{i,t} \tag{11}$$

where:

$\lambda_{i,t}$ = abnormal volume residual for company i on day t

$AV_{i,t}$ = actual proportion of the shares of company i trading on day t

$EV_{i,t}$ = expected proportion of the shares of company i trading on day t

The expected volume- generating model is:

$$EV_{i,t} = \gamma_i + \delta_i V_{m,t} \qquad (12)$$

where:

$EV_{i,t}$ = expected proportion of the shares of company i trading on day t,

$V_{m,t}$ = proportion of total shares traded on LSE on day t, and

γ_i, δ_i = the intercept and slope estimates respectively.

Trading volume data was obtained from Datastream.

Trading volume delta factors are calculated using daily data observations for the previous calendar year. Thus in equation 12 we use the "delta" coefficient generated from the 1993 calendar year regression as our proxy for how company trading volume varies with market trading volume for the 1994 calendar year. This approach is analogous to that adopted for

price outlined in section 4.5.2.1 above. (The average coefficient of determination for the market-adjusted trading volume regression is 8% with a range from zero to 30%. These results are consistent with previous research using daily data (Bamber, 1986, Morse, 1982(b)) The slope coefficient (δ_i) is significant at $\alpha=0.05$ in all but 6% of cases whilst the intercept term (γ_i) is only significant at $\alpha=0.05$ in 3% of cases).

However, isolating the volume residuals involves two issues that are not present in the calculation of the price residuals:

(1) Trading volume may not be normally distributed.

(2) A two- tailed test is inappropriate, as only the largest market-adjusted volume residuals are relevant for our study. Thus large volume residuals will be driven by either positive or negative firm- specific news.

Accordingly, volume outliers are identified based on the number of abnormal price movements observed for each firm for each year. Thus, if a firm has 12 abnormal price outliers in 1994 and 13 abnormal price outliers in 1995, then the 12th and 13th largest market- adjusted trading volume movements for 1994 and 1995 respectively are chosen for the purposes of our study.

4.5.4 Event Window

In order to capture the firm- specific news event driving the abnormal price movements and trading volume activity a five-day window either side of the abnormal price movement or trading volume movement is employed. In line with absence of price/trading volume activity taking place outside an 11-day window in the three related studies discussed above, an 11-day window centred on the date of the abnormal price change or trading volume movement is employed in our study.

Price changes prior to public announcement can occur when some subset of investors receives a signal prior to public announcement. It is also possible that there is a time delay between the actual information release event and its formal publication in the media.

A change in price in the days following a public announcement could imply delays in the dissemination of the information, the release of further corroborating information later, or alternatively, investors may require an information processing period to absorb the implications of the information release.

In addition news may come out on a Saturday or Sunday. In this case there will be no price reaction until the Monday, an apparent one or two day lag as a result of the market's closure over the weekend.

Trading activity may also occur prior to a public announcement because of differences in beliefs about the probability of different signals being

emitted by the announcement. These differences may be attributable to the asymmetric distribution of the information prior to its announcement.

Trading volume following the announcement may be due to different interpretations of the announcement and/or investors returning to balanced portfolio positions after taking speculative positions prior to the announcement.

We find that 73% (71%) of "explained" company specific news items in our sample occur either on the same day or within one day either side of the price (trading volume) movement. This percentage increases to 90% if a three-day window either side of the event day is employed (Appendix 5).

4.5.5 Sources of Company-Specific Information Releases

Having identified the largest market- adjusted price changes and trading volume movements the next step is to associate these with company news items.

It is crucial that that our sources of company specific information capture all value relevant information releases. There are four key information sources in the UK:

(1) London Stock Exchange News Announcements available on FT Graphite

(2) Financial Times on CD ROM

(3) McCarthy Information Fiche available on CD ROM

(4) Reuters

The first three sources are equivalent to those employed in previous studies. Morse (1982) and Thompson, Olsen and Dietrich (1987) use the Wall Street Journal Index whilst Brookfield and Morris (1992) use the McCarthy Information Fiche. The Wall Street Journal is the US equivalent of the Financial Times. We use the first three databases as our primary sources of company news. We investigate the incremental information content of Reuters on a pilot basis only, as it is not generally available for academic research purposes.

4.5.5.1 FT Graphite

FT Graphite contains a listing of all the mandated company news announcements by the London Stock Exchange.

4.5.5.2 Financial Times

The Financial Times (FT) is one of the world's leading business newspapers. The Financial Times on CD ROM is a huge database of financial and economic news, providing essential and timely information for the analysis of business events and trends, both international and UK based. Archive disks from 1988 are available. The FT is the UK equivalent of the Wall Street Journal.

4.5.5.3 McCarthy Information Fiche

McCarthy Information fiche is a unique compilation of company, industry, and market information and news and is one of Europe's leading databases of company and industry information. More than 150,000 articles are selected from more than 40 newspapers and business magazines each year, indexed by company name, industry, country, and type of news. McCarthy also includes articles from the Financial Times but its coverage is not complete.

4.5.5.4 Reuters

Reuters is one of the world's leading news agencies with 216 bureaux serving 157 countries. Reuters is a major source of financial information with data sourced from 267 exchanges and OTC markets worldwide.

The ultimate objective is to assign all abnormal price and trading volume outliers to one of a number of exhaustive and mutually exclusive categories of firm specific information release using the information sources specified in section 4.5.5 above.

The initial classification scheme for news items is based on categories of events drawn from the three previous studies on the relationship between news releases and price and/of volume behaviour (Brookfield, and Morris, 1992; Thompson, Olsen, and Dietrich, 1987; and Morse, 1982). (See Appendix 4). This initial classification scheme was augmented by those additional news categories suggested by our sample of stockbroking analysts in chapter 5 as being important (See Table 24).

In cases where a news event could not be assigned to any of these sources additional news categories were created. To ensure accurate and unbiased classification of news items to information categories a research assistant (MSc. student) was employed and the senior researcher audited on a 100% basis the assignments made.

In most cases classification of the information event was self-explanatory, e.g. release of the preliminary results. However, in other cases some interpretation of the news items was necessary prior to assignment to categories. In these cases, the press comment was retained and the two researchers independently assigned the news items to information categories. Once this process was complete the researchers discussed and agreed their assignments. A third researcher was asked to

adjudicate on the news content of those articles where the first two researchers were unable to agree (less than 1% of cases). In some cases it was not possible to allocate a news item to one specific category and, in such cases, (less than 5% of the total) the price or trading volume movement was allocated to more than one news category.

The final list of categories (32 in total) is contained in Appendix 6 together with a brief description of the types of news items assigned to the various categories.

4.5.6.1 News Categorisation Strategy and Examples

Where there is more than one news announcement for each price or trading volume outlier within the +/- 5 day timeframe, the news announced on the date nearest day zero takes precedence over other announcements. Day zero is the event date and not its publication date. Thus, for example, an event published in the Financial Times on a Tuesday is assumed to take place on the Monday, unless the FT indicates that the event date was earlier.

For example, an announcement taking place on day +1 is given precedence over an announcement taking place on day +2.
This rule applies unless the press comment itself suggests that the later event was the ultimate trigger of the move and that for some reason there was a delay in reaction.

In circumstances where a price or trading volume move appears to be triggered by two events occurring equidistant to the date of the price or trading volume movement then they are both treated as the ultimate trigger unless surrounding press comment tends to suggest otherwise. An example of this is where there are two potential events one occurring on day +2 and one occurring on day −2. Thus we do not give precedence to those events that may imply possible insider information (price/ trading volume movement occurring before the event) over those events that may imply delay in information processing (price/ trading movement occurring after the event). Both are treated equally.

However, in cases where it appears that the event occurs before the price movement simply because the event is published over the weekend, when the Stock Exchange is closed, we adjust the publication date accordingly. Thus if a price movement occurs on a Monday and an "event" is published on a Saturday we assume that the event was published on the Monday.

In cases where two or more announcements take place on the same date, then precedence is given to the 'ultimate trigger' of the event. One typical example is where there is an analyst's recommendation along with an earnings announcement. In such cases, the analyst's recommendation, unless specifically indicated to the contrary, is assumed to be triggered by the earnings announcement. In most cases this is not problematical, as the press comment will usually quote from the broker indicating that the stock was rerated based on the results.

In the same way where an "event" occurs on the same day as a director's share deal precedence is given to the "event". This is because a director's share deal is not of itself an economic event. It is only a proxy for information.

Dividend announcements are typically made at the same time as earnings announcements. Therefore, they are indistinguishable from the information content of earnings and are consequently assigned to the earnings announcement category.

4.5.6.2 Analysts' Recommendations and Earnings Forecast Revisions

Given the importance of the sell- side analyst in our study we review here in detail how we decided whether a price change or trading volume movement is driven by an analyst's investment recommendation or earnings forecast revision.

A cursory examination of the text of stockbrokers' recommendations reveals that a proportion of stockbroker buy recommendations represent a belief that the market has overreacted to past bad news. Our results in chapter 3 on the "absolute" value of sell-side analysts' buy recommendations are consistent with this (section 3.7.1).
If there is a buy recommendation and two days before this there is a negative share price movement, the buy recommendation may have been triggered by the price decline and not vice versa. The same reasoning

applies to positive price movements occurring before stockbrokers sell recommendations.

Additionally, if a negative price movement follows a stockbroker's buy recommendation or a positive price movement follows a stockbrokers sell recommendation, the stockbroker's recommendation is not recorded as the ultimate trigger even if no other events occur in the 11-day window. This is because the price movement is in the wrong direction. Thus we would hypothesise that some other unobservable event is triggering the price movement not the stockbroker's recommendation.

In summary, therefore, in order for a stockbroker's recommendation to be regarded as the ultimate trigger of a price movement, a buy (sell) recommendation must be accompanied by a positive (negative) price movement occurring either before or after the recommendation.

A positive (negative) price movement occurring before an analyst's buy (sell) recommendation may be consistent with prior dissemination to clients whilst a positive (negative) price movement after the recommendation may be consistent with a delay in information processing.

4.5.7 Completeness of Our Information Sources in Picking up those News Items Explaining Company Price Changes and Trading Volume Movements

Table 13 reports that, across our entire sample, 24% of abnormal price movements and 26% of abnormal trading volume movements are apparently not related to our sources of reported news. However, the proportions "unexplained" differ considerably across index membership.

Table 13

Proportion of Price Changes (Trading Volume Movements) that are Apparently Unexplained by Publicly Available Information

	Price Changes	Volume Movements
All companies	24%	26%
FTSE 100	9%	12%
FTSE Mid 250	32%	33%

The results presented in Table 13 raise potential concerns as to whether our methodological approach has enabled us to pick up substantially all available sources of "publicly" available information to match to company price changes and trading volume activity.

We investigate several possibilities for this apparent lack of 100% association between news events and price and trading volume movements:

(1) Industry co-movement not picked up by the financial press

(2) Limitations associated with our sources of company related news

(3) Factors associated with a company's information environment

These issues are discussed below in separate subsections.

4.5.7.1 Industry Co-Movement

Previous research documents that industry co-movement may have additional explanatory power over the market alone in explaining share returns (e.g. Rosenberg and Guy, 1976; Draper, 1975). Draper (1975), using UK data, shows that on average 55% of share price movements can be explained by market wide effects, a further 15% by industry factors, and the residual 30% by firm specific news.

Foster (1986) argues that such industry co-movement may arise when the information releases of firm j are used to make inferences about the share price of firm i. For example, firm j's earnings releases could convey information about how movements in key variables are affecting profitability of other firms in an industry. A second reason is that firm j's release could convey information about competitive shifts in an industry; for example, a report by a major firm in an industry that it had increased its earnings and sales, in an industry with low overall growth, could convey favourable information about that firm but negative information for other firms in that industry.

We investigate the possibility that industry co-movement that is not picked up and reported by the financial press may account for a proportion of our unexplained price movements.

To do this we include the relevant Stock Exchange index for the sector of which the company is a member as an additional variable in our market model outlined in equation 9 above. These indices are sourced from FT Extel. Then we recalculate the residuals assuming that each company has a beta of one with the industry index.

Revised equation 9 is as follows:

$$ER_{i,t} = \beta_i R_{m,t} + D_n \varepsilon_{n,t} \tag{13}$$

where

$ER_{i,t}$ = expected return for company i on day t

$R_{m,t}$ = return on the FT All Share Index on day t,

β_i = LBS beta coefficient for company i, and

D_n, = an industry dummy which equals one if company i is a member of industry n and 0 otherwise

$\varepsilon_{n,t}$ = return on the relevant orthogonalised* FT sectoral index on day t.

(* $\varepsilon_{n,t}$ are the residuals from the regression of the industry sector index (dependent variable) on the FT All share index (independent variable). The residuals from this regression represent that part of the industry sector return that is not driven by the market, thus avoiding the possible double counting of the market impact in equation 13).

The abnormal return metric employed is defined as follows:

$$U_{i,t} = AR_{i,t} - ER_{i,t} \qquad\qquad (14)$$

where

$U_{i,t}$ = the abnormal return associated with company i on day t

$AR_{i,t}$ = actual return for company i on day t

In more than 90% of cases we are left with the same days generating the highest residuals ($U_{i,t}$) as we obtained using equation 9, before the sectoral index is added, indicating that our original results are not substantially affected by industrywide co-movement. Thus we can conclude that unreported "industry transfer" effects are not important factors in providing explanations for our "unexplained" price movements.

It is not possible to apply this approach to trading volume movements as indices are not available for industry trading volume.

These results are not surprising as even though firms are in the same industry they may be exposed to different economic factors. For example, comovements in the "Building and Construction" sector may be affected by regional considerations.

In addition, some Stock Exchange sectors that are nominally sectors have companies that are not operating in similar lines of business. Examples include sectors such as "Diversified Industrials", "Leisure and Hotels", "Support Services", "Distributors". For instance how does one compare First Choice Holidays with Manchester United even though they are both in the "Leisure and Hotels" sector?

Also, even in apparently cohesive sectors a comparison of the SIC codes for companies in the sector can throw up some interesting differences. As a result it is entirely possible that only a few firms within a sector may move together and that these movements are uncorrelated with other firms in the sector.

For both price and volume, we investigate this possibility for the four sectors in our sample (see Table 12) that have 15 or more companies that are constituents of the FTSE 100 or FTSE Mid 250 indexes: Building Materials; Engineering, General; Media; and Retailers, General. We attempt to match the "unexplained" price movements for companies in these sectors to price movements occurring in other companies in our sample that are in the same sector. We employ a three- day window centring on each "unexplained" movement to allow for "industry transfer" delays. We find that less than 7% of "unexplained" price changes can be matched, on this basis, with equivalent price changes in

other companies in the sector, thus suggesting that unreported intra-industry co-movement is not a major factor in providing explanations for "unexplained" price changes.

The same test is applied for trading volume activity and the same conclusions are drawn.

Thus, in summary, using both approaches outlined in this subsection, our results suggest that our "unexplained" price and trading volume movements (residuals) are not explained, to any great extent, by industry co-movement that is not picked up and reported on by our sources of company news.

4.5.7.2 Limitations Associated With Our Sources of Company Related News

Another possibility for the unexplained price and trading volume movements is that they are explicable by publicly available information but that our three databases are not complete.

Reuters Business Briefing (RBB) is the most detailed information source available, although it is not generally available for academic research purposes.

We test on a pilot basis, for three companies whether "unexplained" movements can be explained by news events reported on RBB.

We find that for the three companies concerned very little incremental information of a value relevant nature appears to be reported that can explain our "unexplained" movements.

We conclude even the use of Reuters, were this available, is unlikely to add much value to our study.

4.5.7.3 Firms' Information Environments

Another possibility for these "unexplained" movements may arise from the differential incentives for information gathering for large and small firms (Freeman, 1987; Atiase, 1980).

Thompson, Olsen and Dietrich (1987) show that larger firms receive greater coverage in the Wall Street Journal Index than smaller firms do.

In addition to firm size, index membership can also affect a firm's information environment. McIlkenny, Opong and Watson (1996) shows that companies entering and leaving the FTSE 100 index generate positive and negative residuals respectively. This is attributed to the attention focused on FTSE 100 stocks by fund managers, both for indexing, and stock selection purposes.

Therefore, we argue that there should be an inverse relationship between the percentage of company price movements "unexplained" and market capitalisation and membership of the FTSE 100 index.

A similar reasoning follows for trading volume movements that are "unexplained".

The regression equations are:

$$\%Price = \gamma_0 + \gamma_1 Ln(MV) + \gamma_2 FTSE \tag{15}$$

$$\%Vol = \gamma_3 + \gamma_4 Ln(MV) + \gamma_5 FTSE \tag{16}$$

where:

$\%Price$ = price movements unexplained per company expressed as a percentage of the total number of price movements

$\%Vol$ = trading volume movements unexplained per company expressed as a percentage of the total number of volume movements

$Ln(MV)$ = Natural log of firm capitalisation

$FTSE$ = Dummy variable which equals 1 if the firm is a member of the FTSE 100 index and 0 otherwise

$\gamma_0, \gamma_1, \gamma_2, \gamma_4, \gamma_5, \gamma_6$ = regression parameters to be estimated.

The results are reported in Table 14 below.

Table 14

Regressions of Percentage Price/ Trading Volume Movements Unexplained on Log of Market Capitalisation and FTSE 100 Membership

	Dependent Variable "% Price"	t-Statistic	Dependent Variable "%Volume"	t-Statistic
Intercept	0.87	10.37***	0.95	11.94***
CAP	-0.09	-6.55***	-0.09	-7.88***
FTSE	-0.08	-2.61***	-0.05	-1.54
R^2	44%		46%	
No. of observations	215		215	

*** = significant at the α= 0.01

Table 14 shows that there is a negative relationship between "unexplained" price movements ("%Price") and market capitalisation and membership of the FTSE 100 (α=0.01). In other words, there is a very strong positive relationship between firm size and membership of the FTSE 100 index and the number of price changes that are traceable to our sources of "publicly" available information.

For trading volume, firm size, as measured by the log of a firm's market capitalisation, is negatively related (α=0.01) to the percentage of company trading volume movements unexplained ("%Volume") as expected. However, the relationship between FTSE 100 membership and the percentage of trading volume movements unexplained, though in the expected direction, is not statistically significant at conventional levels but is close to being so.

We conclude that our "unexplained" price and trading volume movements are consistent with the inverse relationship between firm size and the incentives to gather and report company information (Freeman, 1987; Thompson, Olsen and Dietrich, 1987 and Atiase, 1980).

Together with the results obtained in Sections 4.5.7.1 and 4.5.7.2, we argue that alternative information sources, or industry- adjusted return generating models, are unlikely to add value in providing explanations for "unexplained" price movements and trading volume activity.

4.6 Results

4.6.1 Proportion of Company Market-Adjusted Abnormal Price Changes and Trading Volume Movements Driven by Analysts' Recommendations and Earnings Forecast Revisions

Table 15 (Table 16) below summarises those events driving more than 5% of those price (trading volume) movements that could be traced to publicly available information sources. These information events are described in Table 17.

The top eight (seven) categories represent 68.9% (66.3%) of total "explained" price (trading volume) movements with the remaining 24 (25) categories in Appendix 7 (Appendix 8) explaining the remaining 31.1% (33.7%).

Table 15

Summary of the Major News Categories Driving Abnormal Share Price Movements for All Companies

Event category	N	* %
Analysts	772	18.1%
Director share dealing	404	9.5%
Bids	363	8.5%
Preliminary results	349	8.2%
Interim results	328	7.7%
Share deals	296	6.9%
Management changes	223	5.2%
Financing issues	205	4.8%
Total	2940	68.9%

* The percentage the category represents of total
explained price movements.

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Table 16

Summary of the Major News Categories Driving Trading Volume Movements for All Companies

Category	N	* %
Analysts	684	16.50%
Director share dealing	453	10.89%
Share deals	415	9.98%
Bids	375	9.02%
Preliminary results	316	7.60%
Interim results	285	6.85%
Financing issues	230	5.50%
Total	2758	66.34%

* The percentage the category represents of total
   explained volume movements

Table 17

Descriptions of News Items Included in the Major Information Event Categories Reported in Tables 15 and 16

Analysts: sell-side analysts' investment recommendations and earnings forecast revisions

Director share dealing: the granting/exercise of share options together with directors' share purchases and sales.

Bids: announcements in relation to takeover and acquisition activity including references to bid launches; pronouncements regarding acceptance/rejection of offers; Takeover Panel statements; DTI approval/rejection etc. News items relating to bid rumours are included in the "speculation about bids/disposals" news category.

Preliminary earnings: Announcements of results/dividends for the financial year.

Interim earnings: announcements of interim results/dividends.

Share deals: news relating to large trading volume activity in a company's shares-principally institutional purchases/sales. Excluded are new share issues which are dealt with as part of the "financing" category.

Management changes: News items relating to appointments/ dismissals/ retirements from senior management and the board of directors. Also included is news relating to changes in managerial compensation packages. Excluded are share options granted to directors which are included in the "director share dealing" category.

Financing: Issues relating to new share capital (equity, bonds, bank loans etc); restructuring of existing share capital including share repurchase Warrants. Options granted to directors are included under "director share dealing").

We are forced to reject the null hypothesis $H_0 1$ that analysts' recommendations and earnings forecast revisions will not generate a significant proportion of companies' major price changes and trading volume activity.

Analysts' recommendations and earnings forecast revisions constitute 18% of total "explained" price changes and 16% of total "explained" trading volume movements. Therefore, consistent with our expectations, analysts' recommendations and earnings forecast revisions have a significant effect both on the markets consensus expectations (price changes) and, in addition, significantly alter investors' idiosyncratic beliefs. These proportions represent analysts' recommendations and earnings forecast revisions that do not occur simultaneously with other firm specific news releases and, therefore, may be regarded as indicative that analysts do have superior information processing skills and/ or access to "private" information and do not simply piggyback on other news releases.

Our results contrast with Brookfield and Morris (1992) and Thompson, Olsen and Dietrich (1987) who did not find significant price activity associated with analysts' recommendations and earnings forecast revisions. However, as we previously report neither study includes analysts' earnings forecast revisions and recommendations as a separate news category of their own right. Analysts are amalgamated with management forecasts in Thompson, Olsen and Dietrich and with newspaper predictions in Brookfield and Morris.

Another potential problem associated with both the studies of Brookfield and Morris, and Thompson, Olsen and Dietrich is that they apply the standard event study methodology whereby, for each news category, returns are averaged cross-sectionally on the publication date to assess whether such returns are statistically significant. This approach, however, assumes there is no leakage of the information prior to its public disclosure, or assimilation delays in the interpretation of the information content of the news release or, alternatively, if there is a leakage or delay in assimilating information it is systematic. For example, if all analysts' recommendations are disseminated to clients one day prior to "public" disclosure abnormal price activity will occur on day -1, but if some were disclosed on day -1, others on day -2 etc. daily cross sectional averaging may suggest that they have little or no information content whereas, in fact, they do.

Prior disclosure may particularly be a problem in relation to analysts' investment recommendations where they have incentives to disseminate such releases to their clients prior to the market as a whole. This is evident from studies examining the price/ trading volume impact of the secondary dissemination of analysts' recommendations in the financial press which document price movement prior to "public" disclosure (e.g. Davies and Canes, 1978; Bauman, Datta, and Iskander-Datta, 1995).

Interestingly, this difference in methodological approach adopted in our study may also explain why management related news, which is hypothesised by both Thompson, Olsen and Dietrich (1987) and Brookfield and Morris (1992) to have an impact on company price activity but did not appear to do so. Appendix 5 of our study shows that the "management changes" news category is associated with one of the

smallest contemporaneous associations with price and trading volume activity consistent with both prior leakage and delays in assimilation. We offer no explanation for this finding except perhaps that management news may be a "complex" information flow that may take some time to be assessed by the market (Merton, 1987). In addition, price/ trading volume activity prior to the public disclosure may be consistent with prior speculation, rumours or news leakage.

As we treat the day of the price/ trading volume movement and a five-day window either side as a single event window we do not suffer as much from this potential problem.

In general, other news categories significantly affecting price movements tie in with the news categories hypothesised by Thompson, Olsen and Dietrich (1987), Morse (1982a) and Brookfield and Morris (1992). The only exception is directors' dealing activity which is not included as an information event in any of these studies.

In our study directors' dealing activity is, next to analysts' investment recommendations and earnings forecast revisions, the second most important news category in driving price changes and trading volume activity thus suggesting that a sizeable proportion of such movements are driven by "insider" trades. Previous UK research by Gregory, Matatko, and Tonks (1997) shows that directors' trades are associated with abnormal returns. Donnelly and Walker (1995) working with the earnings response coefficient (ERC) document that the UK information environment may not be as rich as its US counterpart thus increasing the

probability that profits are obtainable from such "insider" trading activity. This may have a bearing on our results with directors' dealings.

4.6.2 Relationship between Firm Size and the Proportion of Company Price Changes and Trading Volume Movements Driven by Analysts' Investment Recommendations and Earnings Forecast Revisions

In section 4.6.1 above we show that analysts' investment recommendations and earnings forecast revisions generate a significant proportion of price changes and trading volume movements, across all companies in our sample. In this section we test the hypothesis, set out in section 4.4.2, as to whether the activities of the sell-side analyst will play a greater role in explaining the share price changes and trading volume movements for "smaller" companies where there are fewer incentives for the financial press to gather and report company information.

In section 4.6.2.1 below we describe our methodology, and in the following subsection we discuss our results.

4.6.2.1 Methodology

We run the following regressions:

$$\%\text{Anal(P)} = \gamma_0 + \gamma_1 \text{Ln(MV)} \tag{17}$$

where:

%Anal(P) = Percentage of price changes that are triggered by analysts' recommendations and earnings forecast revisions

Ln(MV) = Natural log of market capitalisation

γ_0, γ_1 = regression parameters to be estimated

$$\%Anal(V) = \gamma_2 + \gamma_3 Ln(MV) \qquad (18)$$

where:

%Anal(V) = Percentage of volume movements that are triggered by analysts' recommendations and earnings forecast revisions

Ln(MV) = Natural log of market capitalisation

γ_2, γ_3 = regression parameters to be estimated

The results are presented in Table 18 below.

Table 18

Relationship between Company Size and the Proportion of Price Changes (Trading Volume Movements) Triggered by Analyst Activity

	% Anal(P)	t-Statistic	%Anal(V)	t-Statistic
Intercept	-0.28	-2.7***	-0.2	-5.8***
Size	.05	4.8***	0.4	9.6***
R²	9%		30%	
No. of observations	215		215	

*** = statistically significant at the 99% level

We are forced to reject null hypothesis $H_0 2$ that there is no difference in the proportion of companies major price changes and trading volume movements driven by analysts' recommendations and earnings forecast revisions conditioning on company size. In fact, we report a positive relationship between firm size and the percentage of price and trading volume movements triggered by analysts' investment recommendations

and earnings forecast revisions thus suggesting that analyst activity is concentrated in the very largest stocks.

We argued in section 4.4.2 that larger stocks should have rich information environments independently of analyst activity (Thompson, Olsen and Dietrich (1987; Grant, 1980) and that, therefore, the analyst will play a larger role in the gathering, processing and dissemination of information the smaller the size of the firm. Therefore, our results are contrary to expectations.

Donnelly and Walker (1995) report that the UK information environment appears less rich than its US counterpart. We may speculate that such analyst concentration in the very largest UK stocks that we report may partly explain the results of Donnelly and Walker. In this context it would be interesting to conduct a similar study to our study employing US data to examine the nature of the differential information environments.

In summary, our results suggest that the information environment of FTSE Mid 250 stocks are substantially less rich than their FTSE 100 counterparts arising both from share price movements and trading volume activity "explained" by conventional sources (e.g. the financial press) and also from the activities of the sell-side analyst.

4.6.3 Relative Size of the Price (Trading Volume) Movements Associated with Analysts' Recommendations and Earnings Forecast Revisions vis-à-vis other News Categories

In section 4.6.1 we show that analysts' investment recommendations and earnings forecast revisions generate a significant proportion of companies' largest market-adjusted price changes and trading volume movements. In this section we test the hypotheses developed in section 4.4.3. We evaluate the information content, as measured by the size of the price/trading volume movements generated by analysts' earnings forecast revisions and company recommendations vis-à-vis those generated by other company news events, in particular a firm's formal accounting releases. In section 4.6.3.1 we describe our methodological approach, and in the following section we present our results.

4.6.3.1 Methodology

To compare the magnitude of the price/ trading volume activity generated by analysts' investment recommendations and earnings forecast revisions vis-à-vis other major news categories, a non-parametric Mann-Whitney Rank Sum test is performed in the first instance. This is because our price and trading volume residuals are by definition large price movements, and, therefore, may not be normally distributed thus suggesting that a normal parametric t-test of the difference in means of the abnormal returns generated by the various news categories may not be appropriate.

We proceed by ranking the absolute value of the price outliers for each company over the two- year period from highest to lowest. The highest

absolute return residual for each company is assigned the rank of 1, the second highest absolute return residual a rank of 2 etc. In this way an average ranking is obtained for all categories of firm specific news e.g. analysts' recommendations, preliminary results etc. together with a corresponding standard deviation. An F- test is performed on the event categories in Table 19 below. The results of the F-test confirm that the category variances were equal at $\alpha=0.05$. Thus a series of pairwise t-tests assuming equal variances can be performed on the categories.

4.6.3.2 Results

The results of our test on price movements are presented in Table 19 below. An identical methodology is adopted for trading volume activity and the corresponding results are presented in Table 20. Pairwise t-statistics for the news event categories contained in Table 19 and 20 are reported in Appendix 9.

Table 19

Mann-Whitney Rank Sum Test on The Major Categories Of News Events Driving Large Price Movements For All Companies

Category	Average	Std Dev
Interim results	10.83*	8.01
Preliminary results	11.50*	8.29
Bids	12.92*	7.89
Financing issues	12.99*	8.04
Management changes	14.06	7.83
Analysts	14.64	7.78
Director share dealing	14.81	8.16
Share deals	14.94	7.78

* =statistically different from Analysts at $\alpha=0.05$

Table 20

Mann-Whitney Rank Sum Test on The Major Categories Of News Events Driving Major Trading Volume Movements For All Companies

Category	Average	Std Dev
Share dealing	11.76*	7.92
Interim results	11.93*	7.96
Preliminary results	12.55*	7.72
Bids	13.09*	8.06
Financing	13.54	8.53
Director share deals	13.56	7.47
Analysts	14.32	7.61

* =statistically different from Analysts at α=0.05

We reject H_0 3 that the size of the price changes and trading volume movements triggered by analysts' investment recommendations and earnings forecast revisions do not differ from the size of the price changes and trading volume movements generated by a firm's accounting releases. Table 19 shows that the greatest price changes are generated by the interim and preliminary results. These two news categories are statistically different, at the α=0.05 level, from all the remaining news categories, including analysts' investment recommendations and earnings forecast revisions (See Appendix 9).

Table 20 shows that for trading volume activity share deals (unsurprisingly!) interim results and the preliminary results statistically

dominate analysts' earnings forecast revisions and company recommendations (See Appendix 9 for related t-statistics).

Our results therefore suggest that the preliminary and interim results are associated with the greater changes in the market's consensus opinion (as measured by price activity) and, larger changes in individual investors' idiosyncratic expectations (as measured by trading volume movements) than analysts' earnings forecast revisions and company recommendations.

The role of a firm's formal financial releases is not simply to confirm other more timely information releases. Our results demonstrate a significant proportion of the information content of a firm's accounting releases is not, in fact, being anticipated by the market either through more timely information releases or through the activities of the sell-side analyst in gathering, interpreting and disseminating such "more timely" information to the market.

We confirm more rigorously the results of Firth (1981) and Rippington and Taffler (1995) that a firm's non-audited accounting releases are associated with the greatest information content by expressly incorporating the residuals associated with other news categories in addition to those generated by a firm's accounting releases in ranking those residuals. The only exception to the dominance of a firm's accounting releases is that the trading volume activity triggered by the preliminary results is not, on average, statistically different to that generated by most other news releases (as Appendix 9 reports). In contrast Firth (1981) reports the preliminary announcement generates, on average, the largest trading volume activity. However, we argued in

section 4.2.1 that there are potential problems associated with Firth's methodological approach.

We may speculate that because arguably the preliminary results are the most important announcement in the corporate calendar investors have incentives to gather information more vigorously just prior to the announcement thereby reducing information asymmetry on the announcement and hence trading volume activity.

We reject $H_0 4$ that the size of the abnormal price changes and trading volume movements triggered by analysts' investment recommendations and earnings forecast revisions do not differ from the size of the price changes and trading volume movements generated by company news categories, other than a firm's accounting releases. (In this context, we exclude trading volume movements triggered by share dealing activity as share dealing activity by definition triggers large trading volume activity and, therefore, the interpretation of trading volume as measuring changes in investors' heterogeneous beliefs (see section 4.3) is not appropriate).

Tables 19 shows that, for price changes, analysts' investment recommendations and earnings forecast revisions are dominated, at $\alpha = 0.05$, by takeover bid activity and events relating to companies' financing activity. Thereafter, analysts' earnings forecast revisions and company recommendations do not differ statistically from the remaining news categories, "management", "directors" and "share deals". Table 20 shows for trading volume activity that analysts' investment recommendations and earnings forecast revisions are, dominated at $\alpha = 0.05$ by news relating to takeover bid activity but do not differ statistically from the

remaining two major news categories, "financing" and "directors share dealing".

Notwithstanding the results of this section, the sell-side analyst still plays an important role in keeping the equity market efficient. Even though the news content associated with analysts' investment recommendations and earnings forecast revisions are dominated by certain news categories, in particular a firm's accounting releases and takeover bid activity, the average scores do not differ from the other remaining news categories in Tables 19 and 20.

4.7 Summary and Conclusions

Our results suggest analysts' recommendations and earnings forecast revisions, not occurring simultaneously with other firm- specific information releases, play a significant role in explaining companies' major market-adjusted price changes and trading volume movements. They explain 18.1% of "explained" price changes and 16.5% of "explained" trading volume movements. We show that the price/ trading volume response to analysts' recommendations and earnings forecast revisions does not derive from piggybacking on contemporaneous firm-specific news releases (e.g. analyst issues a buy recommendation on the same day as a firm reports unexpectedly favourable preliminary results to the market).

Our results are consistent with the sell-side analyst playing a major role in keeping the UK equity market informationally efficient. This role may derive from his/her superior processing of existing "publicly available" information (Merton, 1987) and/or from their preferential access to "insider" information (Holland, 1998).

Consistent with the predictions of the information environment literature we expect that the sell-side analyst will play a larger role in explaining the share price changes and trading volume activity for the "smaller" companies in the FTSE 100 and FTSE Mid 250 indexes, where there are fewer incentives for the financial press to gather and report information. We find, however, that contrary to expectations, analyst activity is concentrated in the "largest" stocks whose information environments are already rich thus suggesting that at least part of the analyst's informational advantage may derive from access to "insider" information or value added arising from the analytical process (Bouwman, Frishkopff and Frishkopff, 1987). Privileged access to company management may be one of these sources (Holland, 1998). In addition, we speculate that such apparent lack of analyst focus on FTSE Mid 250 stocks may, at least, partly explain the results of Donnelly and Walker (1995) who suggest the UK information environment is less rich than its US counterpart.

A key issue, however, is whether analysts' investment recommendations and earnings forecast revisions provide a timely source of news to the equity markets, and, in particular, whether such analyst activity will anticipate much of the information content of a firm's formal statutory releases. We rank the price and trading volume outliers in order of magnitude and find analysts' recommendations and earnings forecast

revisions are dominated by the preliminary and interim results. Therefore, contrary to expectations a firm's accounting releases are of considerable value and their role is not simply to confirm more timely news releases. These results show that a significant amount of company news, even for those indexes representing the top 350 companies by market capitalisation, is not anticipated by the analyst, or the market in general, prior to the formal release of a firm's accounting results, thus suggesting that the existence of news services and the stockbroking industry are not substitutes for a firm's accounting results. Our results thus have important public policy implications regarding the importance of statutory accounting releases for even the largest capitalisation stocks on the London Stock Exchange. We thus provide support for Firth (1981) and Rippington and Taffler (1995) who suggest that a firm's accounting results impart valuable information to the market dominating other sources of firm- specific news.

In addition to a firm's accounting releases, we find that analysts' recommendations and earnings forecast revisions are dominated, in terms of information content, by the "takeover bid" and "financing" news categories for price activity and by the "takeover bid" news category for trading volume activity. These results suggest that although analyst activity generates the greatest proportions of companies' largest price changes and trading volume activity, the information content, as measured by the size of the price/ trading volume movement generated, is greater for certain other news categories, in particular, a firm's formal accounting releases.

In addition, we find that in total 24% of "abnormal" price changes and 26% of "abnormal" trading volume activity could not be traced to

company specific information apparently driving these movements. Therefore, it appears that "non-public" information plays an important role in explaining such movements. This appears to be particularly the case for FTSE Mid 250 companies where 32% of their largest market-adjusted returns (33% of trading volume activity) do not appear to be driven by "publicly-available" information. The corresponding proportion for FTSE 100 index constituents is only 9% (12% for trading volume activity).

The next chapter investigates, on a pilot basis, the role of the sell-side analyst in providing explanations for share price movements, particularly for those firms having less rich information environments. In addition, we also use the services of the sell-side analyst to address the nature of any information that is not in the "public domain" driving share price changes and determine whether such information differs in nature from its "publicly-available" counterpart. We argue that potential differences in the nature of the information that is not "publicly available" may explain why such information goes unreported in the financial press in many cases.

CHAPTER 5

COMPANY SPECIFIC INFORMATION NOT IN THE PUBLIC DOMAIN AND THE ROLE OF THE SELL-SIDE ANALYST

5.1 Introduction

Our results in the previous two chapters suggest that the sell- side analyst plays a major role in the UK equity market. In chapter 3 we show that analysts' recommendations have value in an "absolute" sense. In the last chapter we show that analysts' recommendations and earnings forecast revisions explain a significant proportion of companies' largest market-adjusted price movements and trading volume activity. These results

collectively suggest analysts' recommendations and earnings forecast revisions play a significant role in keeping the equity market informationally efficient.

However, we argued in Chapter 2 the analyst's role in keeping the markets efficient remains an unresolved issue. Does any potential informational advantage that the analyst possesses derive from he/she being a superior processor of existing publicly available information (Merton 1987, Bouwman, Frishkopff and Frishkopff, 1987) and/or from the incorporation of private (non-public) information into their investment recommendations and earnings forecast revisions (Fama, 1970; Holland, 1998).

In this chapter we attempt to shed some light on the nature of the analyst's informational advantage, in particular their potential role as a conduit for the dissemination of "non-public" information to the market. We do this by testing their degree of knowledge of the nature of information not "apparently" in the public domain that is driving company price changes.

To establish whether analysts may, in fact, use "non- public" information in arriving at their recommendation changes and earnings forecast revisions it is a necessary precondition that they indeed have access to such information. No existing study on the economic role of the equity analyst addresses the analyst's degree of superior market knowledge directly.

We found in the last chapter that, for those indexes representing the largest 350 companies on the London Stock Exchange, 24% of "abnormal" price movements could not be traced to company specific information apparently

driving these movements. Therefore, it appears that "non-public" information plays an important role in explaining such movements. This appears to be particularly the case for FTSE Mid 250 companies where 32% of their largest market- adjusted returns do not appear to be driven by "publicly- available" information. The corresponding proportion for FTSE 100 index constituents is only 9%, though some companies, particularly those in the lower echelons of the index, have "unexplained" price movements in similar proportions to their FTSE Mid 250 counterparts. We hypothesise that given the pre-eminent role ascribed to the sell-side analyst in the information environment literature he/she will play a significant role in providing explanations for these "unexplained" price movements particularly for those "smaller" stocks where there are fewer incentives for the financial press to gather information.

In addition to directly testing the analyst's degree of market knowledge we also address the nature of the relationship between "unexplained" company price movements and capital market information flows. Are the "non-public" information flows driving such movements attributable to "hard" information that does not enter the public domain because it is either "private" information (Fama, 1970), or because of issues relating to firms' information environments (Freeman, 1987; Thompson, Olsen and Dietrich, 1987; Grant, 1980)? This is an interesting research question the answer to which, as we argued in Section 2.1.2 of Chapter 2, depends on one's definition of "private" information. For our purposes we will define "private" information as those price movements that the analyst is unable to explain.

Another possible explanation for such price movements is that they are driven by "soft" intangible factors such as underreaction, industry sentiment, fashions, overreaction etc (DeBondt and Thaler 1985, 1987; Bernard and Thomas, 1989). These factors may not be reported in the financial press perhaps due to their intangibility. A cursory examination of Appendix 7, discussed in Chapter 4, shows that that only 1.19% of major price movements are "apparently" driven by such sources. These categories are "industry sentiment" (0.82%) and "profit taking" (0.37%). Nevertheless such factors have received considerable attention in the academic literature. Alternatively, there may only be an apparent lack of association between "public" information and share price activity due to information processing and assimilation delays (Cutler, Poterba and Summers, 1989; Merton, 1987).

We use the services of the equity analysts of three leading City of London based stockbroking houses to provide explanations for large price movements of 100 companies, drawn predominantly from the upper reaches of the FTSE Mid 250 index, over the eight week period ending 1st March, 1996 that are not apparently driven by "publicly- available" information. However, our study is by its very nature only a pilot, as the directors of research at the three participating houses, whilst willing to participate in the study, were not prepared, at least initially, to commit their analysts beyond early March, a period coinciding with the height of the annual results reporting season. Therefore, our results are only indicative and should be treated with caution.

The next section 5.2 reviews earlier work on the relationship between capital market information flows and stock market activity measures and sets out our contribution to the literature. In the following section we develop our hypotheses and in section 5.4 our methodology and data are described. In section 5.5 and 5.6 we present our results. A summary and conclusion of our findings are provided in the final section of the chapter.

5.2 Link between Stock Market Movements and Information Flows

Roll (1988) attempts an empirical investigation of a prevailing paradigm, which is that with hindsight financial economists can explain most share price movements with a high degree of accuracy. Roll reports on the cross-sectional distribution of R^2s for 96 large NYSE stocks using a single factor market model and a multifactor APT. Daily data is employed to investigate the incidence and impact of unique news about the firm. Every mention of the firm in either the Wall Street Journal or over the Dow Jones Broadtape is defined as an information event. Regressions on systematic factors are conducted only on non- information dates. These R^2s are compared with the R^2s obtained using all data points. The argument is that it should be possible to substantially improve the R^2 of pervasive factors by considering only periods where there is no reported news about the firm. Thus when there is no observed news, all the observed changes should be due to pervasive

factors. However, even with this "information- censored" data, the average explanatory power is only marginally better. Roll concludes that this may be due to the existence of "soft" information sources in relation to particular shares or industries, or that the unexplained price movements may be due to the existence of non- public (private) information.

We may speculate that "soft" information sources go unreported in the financial press as their intangibility may mean that such sources are difficult for financial journalists to analyse and explain.

The fact that it is difficult to find a robust relationship between various measures of stock market activity and news releases is also apparent with respect to macroeconomic data and stock market index activity. Cutler, Poterba, and Summers (1989) seek to determine whether unexpected macroeconomic news announcements can explain a significant proportion of index price movements hypothesising that such announcements drive stock market activity in aggregate (Chen, Roll and Ross, 1986).

The authors also investigate the importance of pervasive factors other than macroeconomic variables that could potentially affect share prices. They study the market reaction to major non- economic events such as elections and international conflicts, and, in addition, they analyse the largest stock market movements of the last fifty years reviewing coincident news reports to identify, where possible, the proximate cause of these moves.

However, the authors find it difficult to link major market moves to the release of economic or other information. Interestingly on several of the days, their news source, the New York Times, actually reported that there was no apparent explanation for the market's rise or fall. Thus, the authors' inability to identify the fundamental shocks that accounted for these significant market moves is difficult to reconcile with the view that such shocks should account for most of the variation in stock returns.

Their results parallel Roll's (1988) finding that most of the variation in return for individual shares cannot be explained using publicly available measures of new information. They argue that further understanding of asset price movements requires research that attempts to model price movements as functions of evolving consensus opinions about the implications of given pieces of information. In other words, they suggest that the lack of direct association between news and price activity may not be due to "non-public" information but may instead be attributable to delays in the market impounding the information content of public news releases.

Mitchell and Mulherin (1994), working with both macroeconomic and firm specific news, examine whether the amount of information that is publicly reported affects trading volume activity and price movements in equity markets. They take three measures of market activity: (1) daily trading volume, (2) absolute value of daily market returns, and (3) the average of the sum of the absolute value of daily firm- specific returns, and relate them to the broad sample of macroeconomic and firm- specific news announcements released by Dow Jones on the Broadtape and in the Wall Street Journal.

By running regressions the authors find that the number of Dow Jones announcements and market activity are directly related but the relationship is not strong as evidenced by the low regression R^2's. These results parallel the results of a similar study by Barry and Howe (1994) that uses intraday data and suggests that although public information flows do drive price and trading volume activity they only explain a small proportion of such movements. The authors, however, leave unaddressed potential reasons for this other than to suggest that the relationship between public information flows and stock market activity is complex and difficult to model. Alternative hypotheses are advanced by the various authors above as to why such an apparently weak relationship prevails though none of the studies attempts to test these hypotheses.

In summary, therefore, the literature suggests that there is at best a weak relationship between public information and price changes and trading volume activity. These findings tie in with our results in the previous chapter, where we report that for those indexes representing the largest 350 companies on the London Stock Exchange, 24% of significant company market-adjusted price changes could not be traced to company specific information apparently driving these movements. The corresponding proportion for abnormal trading volume activity is 26%.

Our study, in contrast to previous research, attempts to establish the nature of the "unreported news" driving price changes. More specifically we address

the nature of the relationship between firm specific information flows and company market-adjusted price movements. We use the services of three leading stockbroking houses to "explain" the nature of the news driving company price activity that cannot be readily ascertained from "publicly-available" sources. In using the services of the stockbroking houses in this manner we also gain insight into analysts' degree of market knowledge and, in particular, their potential role as a conduit for the dissemination of "non-public" information to the market.

5.3 Hypotheses

The activities of the sell-side analyst constitute a major component of a firm's information environment. The degree of analyst neglect dominates firm size and other empirical anomalies such as low P/E and the January seasonality effect in explaining returns (Arbel, 1985). Given this prominence associated with the sell-side analyst in the literature we argue that he/she has a high degree of market knowledge and will be able to explain a significant proportion of price movements not apparently in the public domain, particularly for those companies in the upper reaches of the FTSE Mid 250 and lower echelons of the FTSE 100 where, based on their size, there are

fewer incentives for the financial press to gather and report information (Grant, 1980; Thompson, Olsen, and Dietrich, 1987).

H_0 5: *Sell- side analysts do not have a high degree of market knowledge and are unable to explain a significant proportion of "unexplained" price changes for those companies in the upper regions of the FTSE Mid 250 and the lower echelons of the FTSE 100.*

Merton (1987), Arbel, Carvell and Strebel (1983) and Arbel (1985) argue that the degree of analyst following is a critical component of a firm's information environment and firms that are less closely followed by the analyst community are more likely to be subject to anomalous behaviour. The empirical findings of Lo and MacKinlay (1988) on short- term price inertia, Hew, Skerratt, Strong, and Walker (1996) on the post-earnings-announcement drift and Zarowin (1990), on overreaction all support the view that anomalous behaviour is driven by firm size, an empirical proxy for a firm's information environment.

We work with "smaller" companies as we might speculate, as Merton (1987) does, that increased analyst coverage may reduce the incidence of such anomalies for larger FTSE 100 companies as analysts' superior information gathering and processing skills will keep the equity markets more efficient in respect of these companies.

We report in Section 5.1 above that only 1.2% of major price movements and 0.5% of major trading volume activity appear to be driven by "soft" sources. Do such "soft" sources go unreported in the financial press as perhaps due to their intangibility it is difficult for financial journalists to rationalise and explain and consequently is the analyst, with his/her specialised knowledge and analytical skills will be in a stronger position to "explain" such information flows? Null hypothesis 6 below follows on from this:

$H_0 6$: "Unexplained" price changes, for "smaller" companies, are not materially driven by "soft" information sources such as underreaction, sentiment, profit taking, overreaction etc.

5.4 Methodology and Data

5.4.1 Company Selection

In selecting our sample companies we focus only on those companies in the upper regions of the FTSE Mid 250 and the lower reaches of the FTSE 100

indexes. Our research in the last chapter shows that, as we expected, the smaller the company the lesser the apparent degree of association between price/ trading volume activity and "publicly- available" information. Whereas for FTSE 100 companies we reported that only 9% of their market-adjusted price changes are "unexplained" by reference to "publicly-available" information the corresponding percentage for FTSE Mid 250 companies is 32%. In this regard our results are consistent with the arguments made in the information environment literature in general and the empirical results reported by Grant (1980) and Thompson, Olsen and Dietrich (1987) in particular.

We hypothesise that the sell- side analyst will play a major role in providing explanations for "unexplained" price movements for those FTSE Mid 250 and smaller capitalisation FTSE 100 companies where there are fewer incentives for the financial press and news services in general to gather and report information.

In order to be included in our sample companies had to have a market capitalisation in excess of £100m. In addition all companies in the sample had to be followed by two of our three participating stockbroking houses so as to mitigate potential problems of ex-post rationalisation bias. (See Section 5.4.4 below).

The participating stockbroking houses (See section 5.4.4) agreed to provide the services of their analysts covering 13 Stock Exchange sectors in total. 87 FTSE Mid 250 companies were followed by two stockbroking houses, came from one of the thirteen sectors and satisfied the minimum capitalisation

requirements. 13 companies drawn from the lower echelons of the FTSE 100 were added to our sample to bring the total sample size to 100 companies. Table 21 below reports on the size characteristics of the 100 firms in our sample whilst a full listing of the 100 companies and their sectoral decomposition are provided in Appendix 10.

Table 21

Summary Size Statistics (n = 100)

	Market Capitalisation (£m)
Mean	1280
Standard deviation	860
Maximum	3830
Minimum	100
Median	1000

5.4.2 Time Period

The market-adjusted daily price movements for the 100 companies were monitored over the 8- week period ending 1st March, 1996. An eight- week

period is chosen as our study is only a pilot project and, in addition, because the company reporting season reaches its most intense phase in early March the directors of research were unwilling to commit their analysts beyond this period.

5.4.3 Return Generating Model and Identification of Outliers

The exact same methodology as was adopted in the last chapter for calculating abnormal returns and identifying price outliers is adopted for the 100 companies in our sample. After the close of business on each Friday of our eight- week study daily market- adjusted returns are calculated for each of the 100 companies. The returns generated are then compared to the mean returns for 1995 plus or minus 2 standard deviations. If the returns are above or below this number they are classified as "outlier" price movements that because of their size should be associated with firm specific news and not noise per se. Table 22 provides a summary analysis of the distributional characteristics of the abnormal returns generated.

Table 22

Abnormal Daily Price Movements: Summary Statistics

	%
Mean (absolute)	3.5
Standard deviation	3.6
Maximum	8.0
Minimum	-9.2

5.4.4 Selection of Stockbroking Houses

We approached three stockbroking house all of whom agreed to participate in our study: SBC Warburg, James Capel and Credit Lyonnais Laing. These houses rank 2nd, 4th and 9th respectively in the 1995 Extel Ranking of Investment Analysts Survey, and, therefore their analysts would be expected, a priori, to have a high degree of market knowledge. The directors of research at the three stockbroking houses were willing to participate in our study, at least on a pilot basis. They were interested in the nature of the major news categories driving companies' major price changes and in particular, whether there were a number of pervasive themes on which their analysts could usefully focus their attentions.

In addition, they were interested in their analysts' degree of market knowledge of the "events" driving price changes in companies that the houses themselves actively follow.

To obviate the potential problem of ex-post rationalisation bias we ensure that two stockbroking houses research each of the companies in our sample. We are thus able to test the consistency of analysts' responses.

We met all the participating analysts and briefed them as to the objectives of our study. In addition, the directors of research emphasised to them the benefits to the house thus ensuring, insofar as possible, the analysts' active collaboration and participation in the study.

We distributed a copy of the "Analysis of Major Price Changes" form that we intended to send them at the end of each week, for their comments on its structure and content. (See Appendix 11 for a pro-forma). The "Analysis of Major Price Changes" form asks the analysts to record the reasons driving the price change and, in addition, requests them to record whether the price changes results in any associated action by them e.g. an earnings forecast revision, recommendation change, comment to salesmen etc.

5.4.5 Sources of Company-Specific Information Releases

It is crucial that that our sources of company specific information capture value relevant information releases. Our sources of firm specific news are the Financial Times and the Stock Exchange News Announcements reported on FT Graphite.

The Financial Times is the UK equivalent to The Wall Street Journal, the primary source used by Morse (1982) and Thompson, Olsen and Dietrich (1987).

As we monitor and seek explanations for companies' largest market-adjusted returns each week we cannot use an archival CD ROM based system such as McCarthys Information Fiche (used by Brookfield and Morris, 1992) which is updated only on a periodic basis. Unfortunately, a real time database such as Reuters or Blombergs is not generally available for academic purposes.

5.4.5.1 FT Graphite

FT Graphite contains a listing of all the mandated company news announcements by the London Stock Exchange.

5.4.5.2 Financial Times

The Financial Times (FT) is one of the world's leading business newspapers. The Financial Times is a huge database of financial and economic news, providing essential and timely information for the analysis of business events and trends, both international and UK based. The FT is the UK equivalent of

the Wall Street Journal.

5.4.6 Procedure for Seeking Explanations for "Unexplained" Price Movements

If the reason for the price "outlier" could not be ascertained by reference to a news event reported in either the Financial Times or Stock Exchange news announcements relating to the same day as the price change we dispatched our "Analysis of Major Price Changes Form" via fax to the relevant analysts for explanation.

In the last chapter we employed an 11-day window whereas in this chapter a 1-day window is used. The reason is that our study in this chapter is a self-standing test of analysts' ability to "explain" the reasons apparently driving price movements not obviously in the public domain. In other words, we are directly testing analysts degree of market knowledge. In addition, by employng only a 1-day window analysts should be able to provide explanations for any apparent information processing delays (Merton, 1987; Cutler, Poterba and Summers, 1989).

We dispatched the "Form" on the Monday morning of the week following the week of the "unexplained" price changes. The personal assistants to the directors of research agreed to co-ordinate the collection of the completed

forms, follow up the analysts for their responses and return these responses via fax on the Monday afternoon.

5.5 Results

5.5.1 Principal Findings

There are a total of 166 major market- adjusted daily share price movements for the 100 companies in our sample over the eight-week period of the study. Table 23 summarises these news events with 28 cases or almost 6 out of 10 attributable to company results or bid rumours.

Of these only 48 (or 29%) could be traced to publicly available information reported in the Financial Times and/or via Stock Exchange News Announcements.

Table 23

Summary of Abnormal Price Movements
Explained by Publicly Available Information

News Category	n	%
Mergers/acquisition activity	16	33
Annual results and dividend declaration	12	25
Large share trades	8	17
Company announcements other than mergers	6	13
Company restructuring activity	2	4
Board changes	2	4
Joint venture announcement	1	2
MBO	1	2
Total	48	100

In the last chapter we report that for FTSE Mid 250 companies 32% of price changes cannot be traced to "publicly-available" information. This contrasts with 71% in this chapter. However, our results in this chapter should be treated with some caution as we are likely to underreport the degree of association between price changes and "public" information due to our more restricted sources of company news. In addition, in chapter 3 we employ an 11- day window whereas in this study, as discussed in section 5.4.6, the window is only 1 day.

The remaining 118 major market-adjusted daily price movements (representing 71% of the total) were despatched to the analysts at the participating houses for explanation. 103 replies were received, 26 of which were for two analysts following the same stock in different

houses. Thus analysts provided responses for 90 of the 118 price movements, a response rate of 76%.

Table 24 provides a breakdown of analysts' explanations for these price movements and Appendix 12 provides analysts' detailed responses.

Table 24

Summary of the Explanations Received from Analysts for the Information Events Driving Major Share Price Movements

Explanation	Total	%
Trading volume	12	13
Takeover bid rumours	11	12
Company presentations to analysts/ institutions	8	9
Analysts' recommendations	6	7
Industry transfer	6	7
Industry/company sentiment	5	6
Volatile price	4	4
Rumours other than bid	4	4
Previous over/under reaction	4	4
Restructuring	3	3
Stock switching within a sector	3	3
Input price changes	3	3
Product information	3	3
New contracts	2	2
Profit taking	2	2
Profit warning	2	2
Market conditions abroad	2	2
Buying on cheapness	1	1
Speculation prior to results	1	1
Financing	1	1
No apparent reason	7	8
Total	90	100

We are forced to reject H_0 5 that sell- side analysts do not have a high degree of market knowledge, and that they are unable to explain a significant proportion of "unexplained" price changes for those companies in the upper regions of the FTSE Mid 250 and the lower reaches of the FTSE 100.

Analysts provided plausible explanations for the "unexplained" price movements in all but 7 of the 90 cases (8%). In the 13 cases where two independent analysts reported on the same stock price movement, they were consistent 10 out of 13 times (77%) suggesting that analyst explanations are not necessarily idiosyncratic or speculative rationalisations. However, it is noteworthy that in 86% of cases only one analyst responded. Unfortunately the time period of our study coincided with a significant number of companies reporting their annual results and, consequently, many analysts were absent from their desks briefing institutional clients and attending company presentations leading to the small number of incidents of more than one analyst reporting on each price movement.

5.5.2 Other Indicative Results

Because of the very small sample size and time period covered together with the experimental limitations associated with this pilot study the following results should only be viewed as indicative and treated with caution. Nonetheless, if replicated on a larger sample, with more

stockbroking houses and a longer time frame, the insights provided would certainly shed light on the nature of the information not in the public domain driving company share price activity, and on the role of the sell-side analyst in analysing, interpreting and disseminating such information.

Only 8% of price movements are apparently driven by "private" information as defined in Section 5.1 above, thus suggesting that such information may not play a major role in explaining price activity for our sample companies. In addition, it is noteworthy that 16% of these price movements are generated either directly by analysts' recommendations (7%) or indirectly via company presentations to analysts/ institutions (9%), thus suggesting the important role the analyst perceives he/she plays in interpreting information and communicating their views to the market through their investment recommendations. This is consistent with our results in chapters 3 and 4 where we show that analysts' recommendations and earnings forecast revisions have investment value. Such analyst activity may be underreported in the financial press, at least initially, as any valuable information the analyst gathers is likely to be disseminated to the clients of the stockbroking house prior to its disclosure to the market as a whole.

It is interesting to note in passing that of the 76 price changes that are not attributable to either analysts' recommendations or company

presentations to analysts/institutions that in 19% of these cases analysts stated they rang their institutional clients to inform them of the reasons behind these price changes thus suggesting that such information may not have been available to the market from other sources. (These cases are indicated with an asterix (*) in Appendix 12).

We reject H_0 6 that "unexplained" price changes, for our sample companies, are not materially driven by "soft" information sources such as underreaction, sentiment, profit taking, overreaction etc. 17% of the total "unexplained" price movements are driven by event categories that may be regarded as related to "soft" sources. These categories are:

(1) Industry/ company sentiment (6%)

(2) Previous overreaction (4%)

(3) Profit taking (2%)

(4) Buying on cheapness (1%)

(5) Volatile price (4%)

Explanations for these categories appear in Appendix 12. These categories do not appear as items explaining price movements in the previous chapter thus providing some support for Roll's (1988) hypothesis that a significant proportion of company specific price movements may be related to "soft" information flows and may in fact go unreported in the financial press.

In addition there is also some very preliminary evidence of information assimilation delays in at least 10% of cases as seen in some of the analysts' comments in Appendix 12. These results are consistent with the speculations of Cutler, Poterba and Summers (1989). For example, House of Fraser had three successive days of price changes in excess of 3% triggered by takeover rumours/ pressure for management changes following on from a poor January trading statement (see Takeover Bid Rumours category in Appendix 12). Powell Duffryn had a return of +2.8% on 17th January followed by +3.6% on 19th January triggered by a reappraisal of the company by investors consequent on a presentation to analysts (see Company Presentation to Analysts/ Institutions in Appendix 12).

In further work it would be interesting to ask the analysts why such assimilation delays take place. Is it for instance due to the nature of the news? Is the information content complex to interpret and therefore requires a digestion period, or is it something to do with the information dissemination process itself?

Thus, in summary, our results for this subsection provide preliminary evidence that suggests that a not insignificant proportion of "unreported" information in respect of our sample companies relates to "soft" information sources and to information processing delays thus suggesting that these reasons generate significant price activity for companies with less rich information environments.

5.6 Further Analysis of Analysts' Explanations

It is possible that a proportion of the explanations provided by the analysts were in the public domain and could be picked up by extending the event window to five days either side of the price change. An 11 day window is consistent with the methodology adopted in the last chapter. We find that by extending the event window to eleven days we are able to substantiate 19 (21%) of the analysts' explanations provided in Table 24. (These additional 19 cases are indicated with a '+' in Appendix 12). Of these 19 cases 7 price movements take place prior to the information coming into the "public domain" and, therefore, may be suggestive of "insider" information driving the price activity. Interestingly, 4 of these cases relate to the *Takeover bid rumours* category. The remaining 12 cases occur within the five day period prior to the price movement and, therefore may be consistent with information assimilation delays (Merton, 1987). For the remaining 71 cases (79% of the total) extending the event window to 11 days does not yield any news events thus providing further support for our hypothesis that the sell-side analyst has a high degree of market knowledge.

For two categories of information events *Trading volume* and *Volatile share price* we can substantiate the analysts' explanations by reference to stock market data. If share prices are volatile we would expect the volatilities of these stocks to be higher than the other stocks in our sample. For the four cases reported in Appendix 12 the volatilitities are

in the top 13% of all company volatilities which is consistent with the analysts' explanations.

There are 12 events in the *Trading volume* news category and analysts' explanations are of two types. Eight of these represent price movements that are caused by trading volume activity "suggested" by the analysts to be greater than "normal". (These are denoted with a '♣' in front of the company name in Appendix 12). The remaining 4 are "suggested" by the analysts to be attributable to trading volume activity being less than "normal".

For each company we define "normal" as the average market- adjusted trading volume activity generated in the first 3 months of 1996. The methodology adopted is as follows:

$$\lambda_{i,t} = AV_{i,t} - EV_{i,t} \tag{19}$$

where:

$\lambda_{i,t}$ = abnormal volume residual for company i on day t

$AV_{i,t}$ = actual proportion of the shares of company i trading on day t

$EV_{i,t}$ = expected proportion of the shares of company i trading on day t

The expected volume- generating model is:

$$EV_{i,t} = \gamma_i + \delta_i \, V_{m,t} \qquad\qquad (20)$$

where:

$EV_{i,t}$ = expected proportion of the shares of company i trading on day t,

$V_{m,t}$ = proportion of total shares traded on LSE on day t, and

γ_i, δ_i = the intercept and slope estimates respectively.

Trading volume data was obtained from Datastream.

Trading volume delta factors are calculated using daily data observations for the previous calendar year. Thus in equation 20 we use the "delta" coefficient generated from the 1995 calendar year regression as our proxy for how company trading volume varies with market trading volume for the first 3 months of 1996. This is consistent with the methodology adopted in section 4.5.3 of the last chapter.

We calculate for each company the average "λ" variable in the first three months of 1996 and compare the "λ" generated on the event day with this average. Those "λ's" above the average "λ" are regarded as above "normal" and vica versa.

We find that in all 12 cases analysts' explanations are consistent with the data. Thus analysts' explanations of trading volume activity triggering the "abnormal" price movements appear reasonable.

5.7 Summary and Conclusions

The results of our study provide preliminary evidence on the extent to which information not reported via Stock Exchange News announcements or published in the Financial Times is driving major price movements for companies in the upper reaches of the FTSE Mid 250 and the lower echelons of the FTSE 100. Only a third of major price movements could be traced to these two sources of "publicly-available" information. Analysts are able to provide explanations for over 90% of the major daily price movements not related to these sources thus not consistent with concerns that analysts "don't know". Consistency in terms of explanation, despite the small number of cases, where more than one analyst followed the same stock, is indicative that there is a good degree of market knowledge and the absence of ex-post rationalisation bias. These results are encouraging and suggest that analysts may "know" what is driving price activity in these "smaller" companies.

We show that a number of pervasive themes are associated with unexplained major share price movements, many of which can be categorised as soft information events requiring more judgement and

interpretation to analyse. In addition the market may not impound all information immediately into the share price and, in certain circumstances, there may be information processing delays.

However this study is only a pilot project and, therefore, our results are Only of a very preliminary nature and should be treated with caution. In Any subsequent study we would make the following potential improvements:

First, we would extend coverage to include larger FTSE 100 stocks to establish whether notwithstanding their size a proportion of their price activity is caused by "soft" information and/or information processing/ assimilation delays although our prior expectations are that this is unlikely to be the case. In addition we would include stocks from the lower regions of the FTSE Mid 250 and also USM companies for comparison purposes.

Second, we would redesign the "Analysis of Major Price Changes" form to include questions, asking the analyst to record the timing of the disclosure of the information to the market if it differed to the date of the price movement. We would inquire of the analysts as to why they believe that certain sources of news go unreported? Is it, perhaps due to the intangibility of the information? To restricted availability of the information? Why do they think there are information processing delays? The answers to these questions may provide insight into how "market experts" such as sell-side analysts view the information gathering, processing and dissemination process.

Thirdly, we would extend the number of stockbroking houses participating in any subsequent study to ensure that at least three analysts follow each of the companies. There are two reasons for this.

(a) A difference of opinion between two analysts is difficult to resolve in the absence of a third expert who will hopefully corroborate one of the first two analysts.

(b) Though in our study where two analysts replied they tended to corroborate each other, it is inevitable, that due to analysts busy working schedules, active participation will not always be a priority. Thus the greater the number of analysts following each company the greater the likelyhood that at least two analysts may reply.

The results, so far, are encouraging and validate the methodology adopted. They suggest that a fuller study over a longer time period, with more extensive company coverage, a greater number of participating analysts and incorporating modifications to the "Analysis of Major Price Changes Form" could lead to more definitive conclusions. In this way we may be able to contribute to the debate on how and what information gets to the market and, how such information is processed and assimilated. This has important implications for market efficiency because, as Ball (1992) points out, market efficiency is a pure exchange theory and is silent on how information is gathered and on the process by which the market becomes informed. It simply assumes that given the supply of information rational investors' actions will lead to market efficiency.

CHAPTER 6

SUMMARY AND CONCLUSIONS

In this thesis we set out to address the economic role of the sell-side analyst in the UK equity markets. We conduct three empirical studies evaluating separate aspects of this role.

Chapter three evaluates the economic role of the equity analyst in "absolute" terms by assessing the market's response to analysts' new buy and new sell recommendations. We find that analysts' recommendations have value in an "absolute" sense. Company share prices are significantly influenced by analysts' recommendation changes, not only in the month of the recommendation change but also in subsequent months, thus

suggesting evidence of a post-recommendation drift analogous to the familiar post-earnings-announcement drift (PAD). We find that evidence of this recommendation drift phenomenon is more sustained and long lasting for new sell recommendations than for new buy recommendations. Womack (1996) reports similar evidence using US data.

We also find that the magnitude of the abnormal returns associated with the recommendation changes are influenced cross-sectionally by factors associated with firms' information environments and the analysts' incentives literature. In this context we document higher abnormal returns for both new buy and new sell recommendations conditioning on company size, and also with the issuance of a contemporaneous earnings forecast revision. In addition, for new buy recommendations we find that recommendations issued by a stockbroking house with a superior reputation generate higher abnormal returns than otherwise equivalent recommendations issued by other stockbroking houses. We report no such evidence for new sell recommendations but we speculate that this differential response may be attributable to the incentives for analysts to bias optimistically their investment recommendations, whereby, differences in analyst quality may be reflected in the market's response to new buy recommendations only (Francis and Soffer, 1997). In aggregate our results suggest that analysts' incentives both to gather and disseminate information are important determinants of recommendation performance.

Though we find in chapter 3 that analysts' investment recommendations and contemporaneously issued earnings forecast revisions have market value we are also interested in their "relative" value in explaining companies' "large" market-adjusted share price changes and trading

volume movements vis-à-vis other sources of firm- specific news. In other words, though analysts new recommendations may generate abnormal returns, the size of the abnormal returns may be small compared to those generated by other company news categories thus implying other news categories may have greater information content.

We attempt to resolve this issue in chapter 4 where we address the "relative" value of analyst recommendations in explaining the largest market-adjusted share price changes and trading volume movements for 215 of the largest companies quoted on the London Stock Exchange over the two- year period 1994-1995.

We find that analysts' recommendations and earnings forecast revisions explain a significant proportion of these movements. Thus, not only do their recommendations and earnings forecasts revisions have value in an "absolute" sense, but, they also explain a significant proportion of companies major market- adjusted price changes and trading volume movements on a year- on- year basis.

However, we also report that the information content of analysts' earnings forecasts and company recommendations, as measured by the magnitude of the price/ trading volume response, is dominated by a firm's accounting releases. This suggests that whilst the analyst may communicate valuable information to the market a significant amount of company information is not anticipated prior to the formal release of a firm's accounting results, by either the community of investment analysts, and/or the markets in general.

It is noteworthy that Donnelly and Walker (1995) report that the extent to which prices anticipate earnings in the UK is less than that reported for US companies, suggesting that UK firms' information environments may be less rich than their US counterparts.

Our results in Section 4.6.2 of chapter 4 suggest that analysts play a larger role in explaining share price changes and trading volume activity for FTSE 100 stocks than for those in the FTSE Mid 250. This is contrary to our expectations, as we expected the analyst to be a more important component of the information environment of FTSE Mid 250 stocks, where due to their smaller size, there may be fewer incentives for the financial press to gather and report information and that consequently the analyst would fill this vacuum. It is an interesting speculation as to whether this apparent concentration of analyst effort in the very largest capitalisation companies may partially explain the results of Donnelly and Walker (1995).

In chapter 5 we address in greater detail the analyst's role in respect of "smaller" stocks. We argue that, notwithstanding that fewer analysts follow these stocks, those analysts who do, may play a major role in keeping the market informationally efficient in these stocks. In addition, they may also act as an important conduit for the dissemination of " non-public" information in respect of these stocks to the market. Our results suggest that the sell-side analyst has, in fact, a high degree of market knowledge and is able to account for in excess of 90% of those price movements that we cannot link to " public" sources.

In chapter 5 we also use the services of the sell-side analyst to provide insight into the nature of the information driving "unexplained" price

movements to establish whether such information may differ in type to its "publicly- available" counterpart. We find that a significant proportion of these price movements (17%) are driven by factors that are not "hard" information but rather are factors unrelated to information flows per se, e.g. fads, fashions, industry sentiment etc. In this way we provide empirical support for Roll's (1988) conjecture that a significant number of company market-adjusted price changes may be driven by "softer" factors. In addition we find that there are apparent information processing delays in at least 10% of cases thus suggesting that information is not always impounded immediately into share prices, and the market may, in certain circumstances, take time to assimilate and process information. This is consistent with the speculations of Cutler, Poterba and Summers (1987) and Merton, (1987).

However, our results in Chapter 5 are only of a very preliminary nature and, therefore, should be treated with some caution. Notwithstanding this, we speculate that a fuller study, run over a longer time period, involving the participation of a greater number of stockbroking houses and covering more companies may provide useful insight into how information flows into the capital market, the nature of the market's information assimilation process, and why certain types of information may go unreported or be associated with information processing delays.

The results across our three empirical studies have important public policy implications and suggest sell-side analysts plays a major economic role in the UK equity market. Their investment recommendations and earnings forecast revisions communicate valuable information to the market. Analysts' recommendations and earnings forecast revisions

explaining a significant proportion of companies largest market- adjusted price changes and trading volume movements on a year on year basis. In addition, we provide evidence that the analyst is a knowledgeable source of firm specific information and that he/she may play a pivotal role in communicating valuable "non-public" information to the market.

Our results, in aggregate, suggest that, notwithstanding the reduced reliance placed on the services of the sell-side analyst by the largest fund managers in the UK (Gaved, 1997), they nevertheless play a major role in keeping the equity markets efficient.

Our results show no source of company news release, including analysts' investment recommendations and earnings forecast revisions, has greater information content (as measured by the size of the price/trading volume movement), than a firm's formal accounting releases, thus suggesting that the role of accounting releases is not simply to confirm what the market already knows via potentially more timely news categories.

The results in chapter 5 provide preliminary evidence that analysts have a role to play in communicating "non-public" information to the market thus suggesting that tests of the investment value of analysts' recommendations and earnings forecast revisions may, at least in part, be tests of strong-form market efficiency.

We believe that a potentially fruitful ground for future research is to use the expertise of the sell-side analyst to address, in more detail, those issues relating to efficient markets that we raised in Chapter 5. Such issues have not been addressed heretofore in the literature, as to do so,

requires access to a knowledgeable source of the complexities associated with information processing and dissemination in the equity markets. Our results suggest that the sell-side analyst may indeed constitute such a knowledgeable source.

Another potential area for future research derives from our results in chapter 3. In that chapter we find a post-recommendation drift particularly in relation to new sell recommendations. Anecdotally, the directors of research suggest that for negative news, fund managers do not accept, at face value, recommendations of the stockbroking house. They, therefore, go and seek corroborative evidence from other sources. This process may take time resulting in a delayed price response. In this context, it would be interesting to conduct a study of a sample of stockbroking houses institutional sales desks, using the telephone transcripts, to record any differences in the decision processes and reactions of institutional clients to new buy and sell recommendations. Such issues have not, heretofore, being addressed in the literature.

Appendix 1

Mean Abnormal Returns Around Recommendation Changes (Excluding 5% Tails)

Mean Abnormal Returns Around Recommendation Changes: New Buy Recommendations (Excluding 5% Tails)

Month of change	Abnormal return	t-value
-6	-0.23	-0.89
-5	-0.35	-1.65*
-4	-0.41	-1.65*
-3	-0.78	-3.37***
-2	-0.21	-0.89
-1	-0.74	-3.13***
0	2.37	12.14***
1	0.29	1.40
2	0.04	0.20
3	-0.79	-3.97***
4	-0.24	-1.28
5	-0.55	-2.59***
6	0.01	0.06

Mean Abnormal Returns Around Recommendation Changes: New Sell Recommendations (Excluding 5% Tails)

Month of change	Abnormal return	t-value
-6	-0.30	-0.56
-5	-0.12	-0.36
-4	-0.46	-1.22
-3	-0.76	-2.18**
-2	-0.14	-0.42
-1	-0.47	-1.18
0	-2.75	-9.19***
1	-1.43	-4.02***
2	-0.98	-3.25***
3	-0.62	-2.07**
4	-0.76	-2.95***
5	-1.01	-3.12***
6	-0.82	-2.31**

***=significant at α=0.01
** =significant at α=0.05
 * =significant at α=0.10

Appendix 2

Mean Abnormal Returns Around Recommendation Changes: (Unique Recommendations Changes Only)

Mean Abnormal Returns Around Recommendation Changes: New Buy Recommendations (Unique Buy Recommendations)

Month of change	Abnormal return	t-value
-6	-0.31	-1.18
-5	-0.29	-1.33
-4	-0.54	-2.07**
-3	-0.47	-1.89*
-2	-0.59	-2.37**
-1	-0.73	-3.03***
0	2.74	9.59***
1	0.40	1.85**
2	0.06	0.27
3	-0.70	-3.54***
4	0.04	0.22
5	-0.53	-2.44**
6	-0.07	-0.39

*** =significant at α=0.01
** =significant at α=0.05
* =significant at α=0.10

Mean Abnormal Returns Around Recommendation Changes: New Sell Recommendations (Unique Sell Recommendations)

Month of change	Abnormal return	t-value
-6	-0.31	-0.58
-5	-0.09	-0.29
-4	-0.58	-1.53
-3	-0.76	-2.18**
-2	-0.34	-1.02
-1	-0.63	-1.65*
0	-3.08	-7.25***
1	-1.63	-4.25***
2	-0.88	-2.95***
3	-0.62	-2.07**
4	-0.85	-3.34***
5	-1.03	-2.90***
6	-0.74	-2.15**

*** =significant at α=0.01
** =significant at α=0.05
* =significant at α=0.10

Appendix 3

Mean Abnormal Returns Around Recommendation Changes (adjusted for contemporaneous recommendations made for other firms in the same industry)

New Buy Recommendations

Month of Change	Abnormal return	t-value
-6	-0.25	-0.97
-5	-0.33	-1.56
-4	-0.49	-1.89*
-3	-0.52	-2.13**
-2	-0.48	-1.95*
-1	-0.64	-2.69***
0	2.58	9.24***
1	0.39	1.81*
2	0.06	0.28
3	-0.68	-3.53***
4	0.05	0.27
5	-0.48	-2.25**
6	-0.03	-0.16

New Sell Recommendations

Month of Change	Abnormal return	t-value
-6	-0.18	-0.34
-5	-0.04	-0.14
-4	-0.60	-1.61
-3	-0.71	-2.07**
-2	-0.35	-1.10
-1	-0.66	-1.70*
0	-3.04	-7.12***
1	-1.63	-4.31***
2	-0.93	-3.18***
3	-0.66	-2.20**
4	-0.76	-3.01***
5	-1.10	-3.17***
6	-0.80	-2.32**

***=significant at $\alpha=0.01$
** =significant at $\alpha=0.05$
* =significant at $\alpha=0.10$

Appendix 4

Information Event Categories Used in Previous Research

Brookfield and Morris (1992)

(1) Predictions of interim earnings just prior to their announcement.
(2) Interim earnings announcements, covering quarterly or (more usually half yearly periods.
(3) Predictions of annual earnings just prior to their announcement.
(4) Preliminary earnings announcements, covering yearly periods.
(5) Reports based on a company's annual report and accounts, and/or reports of a company's annual general meeting (AGM).
(6) Company news releases, including statements by the chairman and announcement of new issues, but excluding any statement coincidental with items (1) - (5) above or specifically mentioned in items (7) – (16) below.
(7) Reviews of a company's prospects and profit forecasts by newspapers or stockbrokers (but excluding any report coincident with (2), (4) and (5) above.
(8) Share recommendations by newspapers or stockbrokers but which do not include a detailed profit forecast (classified under (7) above).
(9) Announcement of major new investment projects, the award of contracts and progress on contracts.
(10)   Announcements of redundancies and closures.
(11)   Disposals of subsidiaries and assets.
(12)   Speculation about takeover bids.
(13)   Announcements of bids and material news relating to bids (e.g. counterbids ; acceptances ; references to the Monopolies and Mergers Commission (MMC) ; decisions of the MMC.
(14)   Changes in management (including the Board of Directors).
(15)   Dealings in large blocks of shares (other than those reported under (13)) above.
(16)   Review of industry prospects.

Thompson, Olsen and Dietrich (1987)

(1) Earnings announcements: Quarterly and annual earnings announcements and corrections.
(2) Dividend announcements: Cash dividend, stock dividend, and stock split announcements and corrections.
(3) Accounting / corporate: Changes in accounting methods, independent auditors, corporate bylaws, fiscal year ends, and listing status, plus regulatory actions affecting accounting procedures or disclosures.
(4) Capital / ownership changes: Corporate issuance or repurchase of debt, preferred stock, common stock, and stock options, as well as purchase or sale of stock among investors.
(5) Asset changes: Acquisition and disposition of tangible and intangible assets (including corporate entities), together with announcements of capital expansion plans, joint ventures and revisions of each.
(6) Management related: Changes in management personnel, corporate directors, and management compensation agreements.
(7) Labour related: Events that affect compensation of non-management personnel, employee benefits, occupational safety, and job security.
(8) Forecast / analysis: Financial projections and performance and evaluation of prior performance by managers and outsiders.
(9) Product related : changes in research and development, production, and marketing activities, plus regulatory actions that affect such activities,
(10) Financial distress: Bankruptcy proceedings, default on debt contracts, and restructuring of loan agreements.
(11) Income tax related: Internal Revenue Service actions and corporate responses to those actions.
(12) Not classifiable: all events that cannot be elsewhere categorised.

Morse, (1982a)

(1) An increase in dividends.
(2) A large sale of a product.
(3) An unfavourable earnings forecast by a company official.
(4) A favourable earnings forecast by a company official.
(5) An acquisition.
(6) A construction or building project.
(7) A stock split.
(8) A labour strike.
(9) Quarterly earnings.

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Appendix 5

Association Between Information Event Occurrence And Price/ Trading Volume Movement For The Major Categories Of Information Events Driving Such Movements.**

Association Between Event Occurrence And Price Movement For The Major Categories Of Events Driving Major Price Movements.

	%-5,+5	%-4,+4	%-3,+3	%-2,+2	%-1,+1	% on day
All events	100	96	90	82	73	51
Analysts	100	96	89	78	69	52
Director share dealing	100	93	84	75	61	33
Bids	100	95	90	81	71	49
Preliminary results	100	98	93	87	80	59
Interim Results	100	98	95	93	87	66
Share deals	100	91	83	77	63	39
Share deals	100	91	83	77	63	39
Management changes	100	91	86	77	65	36
Financing issues	100	96	88	82	66	49

- "% -1,+1" represents the percentage of price movements that occur within one day either side of the "information event". The other columns may be interpreted in a similar fashion.

Association Between Event Occurrence And Volume Movement For The Major Categories Of Events Driving Major Volume Movements

	%-5,+5	%-4,+4	%-3,+3	%-2,+2	%-1,+1	% on day
All events	100	96	90	81	71	46
Analysts	100	96	91	77	66	45
Directors share dealing	100	94	86	75	63	34
Share deals	100	95	86	77	62	34
Bids	100	95	89	80	71	46
Preliminary results	100	97	93	88	82	60
Interim results	100	97	95	92	87	68
Financing issues	100	97	92	83	74	47
Management changes	100	92	85	75	61	36

- "% -1,+1" represents the percentage of price movements that occur within one day either side of the "information event". The other columns may be interpreted in a similar fashion.

** The items included in each of the "information events" are described in Appendix 6.

Appendix 6

Description of the News Categories Driving Price and Trading Volume Activity

Analysts: sell-side analysts' investment recommendations and earnings forecast revisions

Director share dealing: the granting/exercise of share options together with directors' share purchases and sales.

Bids: announcements in relation to takeover and acquisition activity including references to bid launches; pronouncements regarding acceptance/rejection of offers; Takeover Panel statements; DTI approval/rejection etc. News items relating to bid rumours are included in the "speculation about bids/disposals" news category.

Preliminary results: Announcements of results/dividends for the financial year.

Interim results: announcements of interim results/dividends

Share deals: news relating to large trading volume activity in a company's shares- principally institutional purchases/sales. Excluded are new share issues which are dealt with as part of the "financing" category.

Management changes: News items relating to appointments/ dismissals/ retirements from senior management and the board of directors. Also included is news relating to changes in managerial compensation packages. Excluded are share options granted to directors which are included in the "director share dealing" category.

Financing: Issues relating to new share capital (equity, bonds, bank loans etc); restructuring of existing share capital including share repurchase,

warrants. (Options granted to directors are included under "director share dealing).

AGM: News relating to the AGM such as Board statements, resolutions passed at the AGM etc.

Speculation about bids/ disposals: stock market rumours relating to possible takeover activity/ disposals but excluding news items occurring after a takeover bid is announced. (See "bids" above).

Government regulations: News relating to the impact of government/EU regulations e.g. OFWAT pronouncements on the water industry, oil exploration permits granted. Specifically excluded are regulations relating to takeover activity. These are included in the "bids" category.

Disposals: News items relating to disposal of subsidiaries and substantial asset sales.

Profit warning and trading conditions statement: Company announcement regarding trading conditions, profit margins, sales prospects etc. Excluded are company announcements made at the AGM which are included under the "AGM" category.

New contracts: News items relating to substantial new orders received or in the process of negotiation.

Review of company prospects: Issues relating to the review of a company's prospects by newspapers and others but excluding reviews by sell-side analysts and company management which are included under the "analysts" and "profit warning and trading conditions" categories respectively.

Product/ input price changes: News items relating to changes in companies pricing strategy including the impact of industry price wars.

Product information: news items relating to market research on new products and expectations regarding success of new product launches.

Rumours other than bid/disposal rumours: Market rumours circulating relating to capital structure changes, contracts, new product introductions etc.

Stock switching: Newspaper comment in relation to investors switching between companies in a sector.

Company presentations to analysts/ institutions: News relating to changes in investor sentiment following companies' presentations to analysts and institutions.

New investment projects: News relating to major new investment projects undertaken by a company such as launching a new business activity, major upgrade of a company's facilities etc.

Industry sentiment: news relating to buoyant or depressed industry sentiment not attributable to any specific cause.

Legal issues: legal issues other than those relating to takeover bid activity (included in "bids" category), such as references to civil action damage claims lodged, settlements reached etc.

Company restructuring: News items relating to company reorganisations and strategy reshaping but excluding issues relating to disposal of subsidiaries and capital restructuring which are included under the "disposals" and "financing" news categories respectively.

Labour related issues: news items relating to employees pay settlements, new work practices and incentive schemes, layoffs and redundancies and industrial activity.

Stake-building/ reduction: news of share acquisition/ disposal activity

Profit taking: news items relating to profit taking/ technical trading not attributable to any specific cause.

Annual earnings prediction: newspaper comments regarding impending preliminary earnings announcements, not attributable to sell-side analysts (included in "analysts" news category).

Thin trading: News items referring to technical squeezes, illiquidity etc

Change in FTSE constituents: News of company moving in/ out of FTSE 100 index.

Change in broker: new broker appointed/ broker dismissed.

Accounting and tax issues: news relating to the effects of a new accounting standard and to changes in a company's tax status.

Appendix 7

Frequency Distribution of the Information Event Categories Driving Abnormal Price Movements For All Companies

Information Event Category	N	%*
Analysts	772	18.08
Director share dealing	404	9.46
Bids	363	8.50
Preliminary results	349	8.17
Interim results	328	7.68
Share deals	296	6.93
Management changes	223	5.22
Financing issues	205	4.80
AGM	166	3.89
Speculation about bids/disposals	153	3.58
Government regulations	134	3.14
Disposals	106	2.48
Profit warning and trading statements	99	2.32
New contracts	90	2.11
Review of industry prospects	86	2.01
Product/ input price changes	69	1.62
Product information	61	1.43
Rumours other than bid/disposal rumours	53	1.24
Stock switching	48	1.12
Company presentation to analysts/institutions	36	0.84
New investment projects	35	0.82
Industry sentiment	35	0.82
Legal issues	34	0.80
Company restructuring	30	0.70
Labour related issues	21	0.49
Stake building/reduction	17	0.40
Profit taking	16	0.37
Annual earnings prediction	12	0.28
Thin trading	12	0.28
Change in FTSE 100 constituents	10	0.23
Change of broker	4	0.09
Accounting and tax issues	3	0.07
Total explained price movements	4270	
Unexplained price movements	1359	32.0
Total price movements	5629	

* percentages of total "explained " price movements

Appendix 8

Frequency Distribution of the Information Event Categories Driving Abnormal Trading Volume Movements For All Companies

Information Event Category	N	%*
Analysts	684	16.45
Director share dealing	453	10.89
Share deals	415	9.98
Bids	375	9.02
Preliminary results	316	7.60
Interim results	285	6.85
Financing issues	230	5.50
Management changes	202	4.86
AGM	173	4.17
New contracts	119	2.86
Government regulations	116	2.79
Disposals	115	2.77
Profit warning	89	2.14
Review of industry prospects	83	2.00
Speculation about bids/disposals	78	1.88
Product/input price changes	73	1.76
Product information	58	1.39
Rumours other than bid/disposal rumours	42	1.01
Legal issues	37	0.66
Stock switching	36	0.89
New investment projects	33	0.79
Company restructuring	31	0.75
Labour related issues	21	0.51
Stake building/reduction	19	0.46
Company presentation to analysts/institutions	18	0.43
Profit taking	14	0.34
Thin trading	13	0.31
Industry sentiment	12	0.29
Annual earnings prediction	8	0.19
Accounting and tax issues	4	0.10
Change in FTSE 100 constituents	3	0.07
Change of broker	2	0.05
Industry transfer	1	0.02
Total explained	4158	
Total unexplained	1431	34.42
Total volume movements	5589	

* percentages of total "explained " volume movements

Appendix 9

Associated Pairwise t-Statistics for the Mann-Whitney Rank Sum Test on the Major Categories of Events Driving Major Price and trading Volume Movements

Mann-Whitney Rank Sum Test on the Major Categories of Events Driving Major Price Movements: Pairwise t- Tests

	Preliminary results	Bids	Financing	Management changes	Analysts	Director share dealing	Share deals
Interim results	1.07	3.46*	3.03*	4.71*	7.39*	6.62*	6.51*
Preliminary results		2.34*	2.06*	3.70*	6.14*	5.51*	5.41*
Bids			0.14	1.76	3.54*	3.32*	3.35*
Financing				1.40	2.69*	2.62*	2.72*
Management changes					0.99	1.12	1.32
Analysts						0.34	0.55
Director share dealing							0.56

*= difference in means significant at α =0.05

Mann-Whitney Rank Sum Test on the Major Categories of Events Driving Major Volume Movements: Pairwise t- Tests

	Interim results	Preliminary results	Bids	Financing	Director share dealing	Analysts
Share deals	0.17	1.64	2.35*	2.67*	3.45*	5.33*
Interim results		1.33	1.97*	2.31*	2.94*	4.54*
Preliminary results			0.89	1.36	1.75	3.34*
Bids				0.64	0.19	2.46*
Financing					.03	1.31
Director share dealing						1.66

*= difference in means significant at α =0.05

Appendix 10

Sectoral Listing of Sample Companies in Chapter 5

Building Materials and Construction

Blue Circle*
Tarmac
BPB Industries
Caradon
Hepworth
Pilkington plc*
Rugby Group
Wolesley
Redland*
Travis Perkins
Wilson Bowden
Wimpey (George)

Chemicals

Allied Colloids
British Vita
Laporte
BTP

* =FTSE 100 constituent

Distributors

Electrocomponents
Farnell Electronics
Inchcape
Lex Service
Cowie Group

Diversified Industrials

Cookson Group*
Lonrho
Trafalgar House
Tomkins*
TT Group
Powell Duffryn
Berisford

Electricity

East Midlands Electricity
London Electricity
Midlands Electricity
Scottish Hydroelectric
Yorkshire Electricity
Scottish Power*

* =FTSE 100 constituent

Electronics

Bowthorpe
Racal Electronics
Delta
Eurotherm
Cray Electronic Holdings
Fairey Group

Engineering

BBA Group
FKI
Glynwed International
IMI
Johnson Mathey
Laird Group
Lucas Industries
Morgan Crucible
Rolls Royce*
Smiths Industries
T&N
Vickers
Weir Group
British Aerospace
GKN*
McKechnie
Halma
Spirax-Sacro Engineering

* =FTSE 100 constituent

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Food

Booker
Dalgety
Hillsdown holdings
Northern Foods
Tate and Lyle*
Unigate
United Biscuits
Associated British Foods*
Albert Fisher
Devro International

Printing, Paper, Packaging

Smith (DS) Holdings
Bunzl
Low and Bonar
De La Rue
Arjo Wiggins Appleton

Property

British land
Brixton Estate
Great Portland Estates
MEPC
Hammerson

* =FTSE 100 constituent

Retailers (General)

Argos*
MFI Furniture
Next*
Sears
Smith (W.H)
Storehouse
Lloyds Chemists
Body Shop International
Brown (N) Group
House of Fraser
Menzies John

Support Services

BET
Chubb Security
Hays
Salvesen (Christian)
Rentokil*
Sema Group

Water

Anglian Water
Northumbrian Water Group
South West Water
Welsh Water
Wessex Water
Yorkshire Water

* =FTSE 100 constituent

Appendix 11

Analysis of Major Price Changes Form

JAMES CAPEL

Analyst: Week ending Friday

COMPANY:

City University Business School Research Study:
What Drives Share Price Changes- The Role of the Sell-Side Analyst

Analysis of Major Price Changes Form

1. The price of   in(de)creased by % after adjusting for market
movements on   . What are the reasons, if any, for this change? (Please
be as specific as possible)

2. Was there any associated action by you e.g. earnings forecast revision,
recommendation change, call to clients, internal note, comment to
salesmen, no reaction etc.?

3. Any further comments generally?

Please attach copy of any internal notes (e.g. for morning meeting) and
return to Paul Ryan via Amanda when completed. Thank you for your
assistance.

Appendix 12

Analysts' Detailed Explanations of the Information Event Categories Driving "Unexplained" Major Share Price Movements

Trading Volume

Name of Company	Date	% Change	Analysts' Comments
Salversen	11/1/96	+2.5%	Analyst 1: Bear squeeze on market makers Analyst 2: Stock shortage
Allied Colloids ♣	11/1/96	-5%	Placing of line of stock by Capels
Glynwed International ♣ Chubb ♣	31/1/96 1/2/96	+3.5% +2.5%	Good buyer in the market Technical buying by Capels
IMI ♣	5/2/96	+4.5%	Good buyer in the market
Rentokil	6/2/96	+2%	Analyst 1: Most thinly traded stock in FTSE Analyst 2: Stock shortage
Rentokil	9/2/96	+2%	Analyst 1: Most thinly traded stock in FTSE Analyst 2: Stock shortage
Hays ♣	14/2/96	+2%	Analyst 1: Technical buying Analyst 2: No apparent reason
Powell Duffryn ♣	21/2/96	-3%	Large sell order
Johnson Matthey	22/2/96	+2%	Thin market
Weir ♣	28/2/96	+6%	One market maker was short and another heard about it and marked up the price
Associated British Foods ♣	1/3/96	+2%	Technical buying

* = analysts discuss with institutional clients the reason behind the price change.

+ = analysts' explanations substantiated by extending the event window to 11 days.

♣ = analysts suggest daily trading volume activity will be greater than normal

Takeover Bid Rumours

Name of Company	Date	% Change	Analysts' Comments
British Aerospace +	8/1/96	+3%	Reaction to defence mergers in the US and is seen as a bid candidate *
House of Fraser	11/1/96	+3.5%	Rebound after disappointing trading statement, is being supported by buyers seeking management changes and is a possible bid candidate *
Mdland Electricity	22/1/96	+4%	Takeover rumours
Lloyds Chemists +	16/2/96	+4%	Analyst 1: Bid speculation Analyst 2: Bid speculation
Pilkington	16/2/96	+4%	Bid rumours and a bear squeeze
Vickers +	16/2/96	+8%	Bid rumours and a market squeeze
Vickers	19/2/96	-2.5%	Lack of appearance of previous week's rumoured bid
House of Fraser +	20/2/96	+4%	Analyst 1: Takeover rumours Analyst 2: Pressure for management change intensified after January trading statement *
House of Fraser +	21/2/96	+5%	Analyst 1: Takeover rumours Analyst 2: Pressure for management change intensified after January trading statement *
House of Fraser +	22/2/96	-3%	Analyst 1: Takeover rumours Analyst 2: Pressure for management change intensified after January trading statement *
Yorkshire Electricity+	1/3/96	+4.5%	Takeover rumours *

* = analysts discuss with institutional clients the reason behind the price change.

+ = analysts' explanations substantiated by extending the event window to 11 days.

Company Presentations to Analysts/Institutions

Name of Company	Date	% Change	Analysts' Comments
BTP	8/1/96	+4.5%	Company visit to institutional holders
Powell Duffryn	17/1/96	+2.8%	Company presentation to investors and bounce back from previous underperformance
Power Duffryn	19/1/96	+3.6%	Company presentation to investors and bounce back from previous underperformance
Next	19/1/96	-3%	Analyst 1: Company was in Scotland making presentation to investors Analyst 2: Perhaps profit taking
Smith (DS) McKechie	23/1/96 25/1/96	+3% +2%	Institutional lunches and lunches with journalists Analyst visit
Smith (DS) BET	26/1/96 1/2/96	+3% +3%	Institutional lunches and lunches with journalists Analyst 1: Large market trade following analyst's visit Analyst 2: Analyst's visit

* = analysts discuss with institutional clients the reason behind the price change.
+ = analysts' explanations substantiated by extending the event window to 11 days.

Analysts' Recommendations

Name of Company	Date	% Change	Analysts' Comments
Tate and Lyle +	8/1/96	-2.5%	Downgrade by CLL and other analysts followed suit
Hepworth	16/1/96	-3%	County Natwest downgraded forecast and since the stock is thinly traded the price dropped
Electrocomponents	19/1/96	+2.25%	Reiteration of buy recommendation by Warburgs
Dalgety	7/2/96	+2%	Major broker issuing a buy recommendation
Blue Circle	12/2/96	+3.5	Hoare Govett, Blue Circle'a brokers, brought out a buy note
Hays	1/3/96	+3%	Recommendation by Warburg

Industry Transfer

Name of Company	Date	% Change	Analysts' Comments
Blue Circle	8/1/96	-3.5%	Redland profit warning
	12/1/96	-3%	Redland profit warning
Argos	10/1/96	-2.5%	Analyst 1: Stock moved in sympathy with Dixons Analyst 2: Market may have been expecting a downbeat trading statement *
British Land	18/1/96	-2.5%	Analyst 1: BZW moving to the Docklands considered bad news for City property prices Analyst 2: BZW moving to the Docklands considered bad news for City property prices
Hays	26/1/96	-2%	Thin market in shares and a markdown by market makers following warnings from small chemical companies *
Tomkins +	31/1/96	-2.4%	Negative reactions to Hanson demerger

* = analysts discuss with institutional clients the reason behind the price change.

+ = analysts' explanations substantiated by extending the event window to 11 days.

Industry/Company Sentiment

Name of Company	Date	% Change	Analysts' Comments
Berisford	9/1/96	-5.5%	Sentiment about UK DIY market
Unigate	19/1/96	+3.5%	Stock shortage in a sector perceived to be a value sector by some investors
Ass. British Foods	19/1/96	+2%	Stock shortage in a sector perceived to be a value sector by some investors
IMI	20/2/96	+2%	Squeeze by investors to pick up previous poor performers
Yorkshire Water	20/2/96	+3%	Analyst 1: US utilities lining up water utilities in their sights * Analyst 2: Stock squeeze and Warburgs produced utility sector review showing Yorkshire Water was undervalued, which may have been the reason

Volatile Share Price

Name of Company	Date	% Change	Analysts' Comments
Body Shop International	12/1/96	+6%	Analyst 1: Share trades in a volatile fashion Analyst 2: Market may have been expecting a bullish trading statement?
Smith (David S)	31/1/96	+2.5%	Volatile Stock
Smith (David S)	14/2/96	+2.7%	Volatile Stock
Smith (David S)	16/2/96	+2.7%	Volatile Stock

Rumours other than Bid Rumours

Name of Company	Date	% Change	Analysts' Comments
Scottish Power	17/1/96	+2.5%	Market rumours of cost reductions prior to announcement *
Vickers	19/1/96	-2.6%	Rumours of delay in product launch *
Johnson Matthey	2/2/96	+3%	Anticipation of bullish electronics materials workshop a few days later *
Rolls Royce +	8/2/96	-3.5%	Previous price run up in respect of rumours of a large order from Singapore reversed after only a small order materialised

Previous Under-Overreaction

Name of Company	Date	% Change	Analysts' Comments
Wolesley	9/1/96	-2.5%	Previous good run in the shares but profit expectations were too high
House of Fraser	25/1/96	+4%	Rebound after dip in share price following the previous week's trading statement
Menzies	6/2/96	+2.5%	Recovery from oversold position
Albert Fisher	9/2/96	-7%	In preparation for management meetings with the investment community, the investment community looked at the stock and realised that its prospects are not good.

Restructuring

Name of Company	Date	% Change	Analysts' Comments
Dalgety +	16/1/96	-2.5%	Doubts over restructuring
Trafalgar House +	22/1/96	+7%	News that the company was selling Ideal Homes subsidiary with consequent improvement in gearing *
Caradon	9/2/96	-5%	Previous strong run up in the stock reversed by announcement of exceptional charge to cover ill-judged diversification

* = analysts discuss with institutional clients the reason behind the price change.

+ = analysts' explanations substantiated by extending the event window to 11 days.

Stock Switching within a Sector

Name of Company	Date	% Change	Analysts' Comments
Electrocomponents	25/1/96	+3%	Switching out of Farnell
Hepworth	31/1/96	+3%	Switching into building stocks capitalising on European recovery
Rugby	6/2/96	+4%	Investors watching the underperformance of Rugby relative to Blue Circle

Input Price Changes

Name of Company	Date	% Change	Analysts' Comments
Arjo Wiggins Appleton	8/1/96	+4%	Pulp prices fall
Blue Circle	1/2/96	+3%	News of cement prices in the US *
Cookson	15/2/96	-2.5%	Worries over semiconductor market *

Product Information

Name of Company	Date	% Change	Analysts' Comments
Racal Electronics	10/1/96	+4%	Racal's stake in Camelot firmed share price and the confidence in the company increased after the recent acquisition of BRT
Lonrho	2/2/96	+3%	Gold price is expected to go higher *
Cookson +	19/2/96	+2.5%	News of two new plants in Asia and bounce back from previous weakness

* = analysts discuss with institutional clients the reason behind the price change.

+ = analysts' explanations substantiated by extending the event window to 11 days.

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New Contracts

Name of Company	Date	% Change	Analysts' Comments
Weir +	8/1/96	+5.5%	Buyers following reports of new contracts
Trafalgar House +	13/2/96	+5%	News of contract in Thailand for subsidiary *

Profit Taking

Name of Company	Date	% Change	Analysts' Comments
BBA	26/1/96	- 3%	Profit taking after strong performance over previous period *
GKN +	7/2/96	-3%	Profit taking *

Profit Warning

Name of Company	Date	% Change	Analysts' Comments
Redland +	8/1/96	-2%	Poor trading statement caused by poor trading in the German market
Redland +	12/1/96	-3%	Poor trading statement caused by poor trading in the German market

* = analysts discuss with institutional clients the reason behind the price change.
+ = analysts' explanations substantiated by extending the event window to 11 days.

Market Conditions Abroad

Name of Company	Date	% Change	Analysts' Comments
Redland	31/1/96	+3%	Announcement by German government of plan to stimulate growth in employment
Hammerson	2/2/96	-2.5%	Analyst 1: Concern regarding exposure to European markets Analyst 2: Negative comment on sector as a whole

Buying on Cheapness

Name of Company	Date	% Change	Analysts' Comments
Northern Foods	12/1/96	+3.25%	Company had a bad time recently due to changes in the milk industry and now looks cheap to some investors

Speculation Prior to Results

Name of Company	Date	% Change	Analysts' Comments
Devro International	1/3/96	-2%	Anticipation of following week's results

* = analysts discuss with institutional clients the reason behind the price change.
+ = analysts' explanations substantiated by extending the event window to 11 days.

Financing

Name of Company	Date	% Change	Analysts' Comments
British Aerospace +	7/2/96	-2.5%	News of Airbus, having to fund a new plane

* = analysts discuss with institutional clients the reason behind the price change.

+ = analysts' explanations substantiated by extending the event window to 11 days.

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